A SPECIAL REPORT ON SIMULATION AND AVIATION TRAINING DEVICES

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ARMY AVIATION

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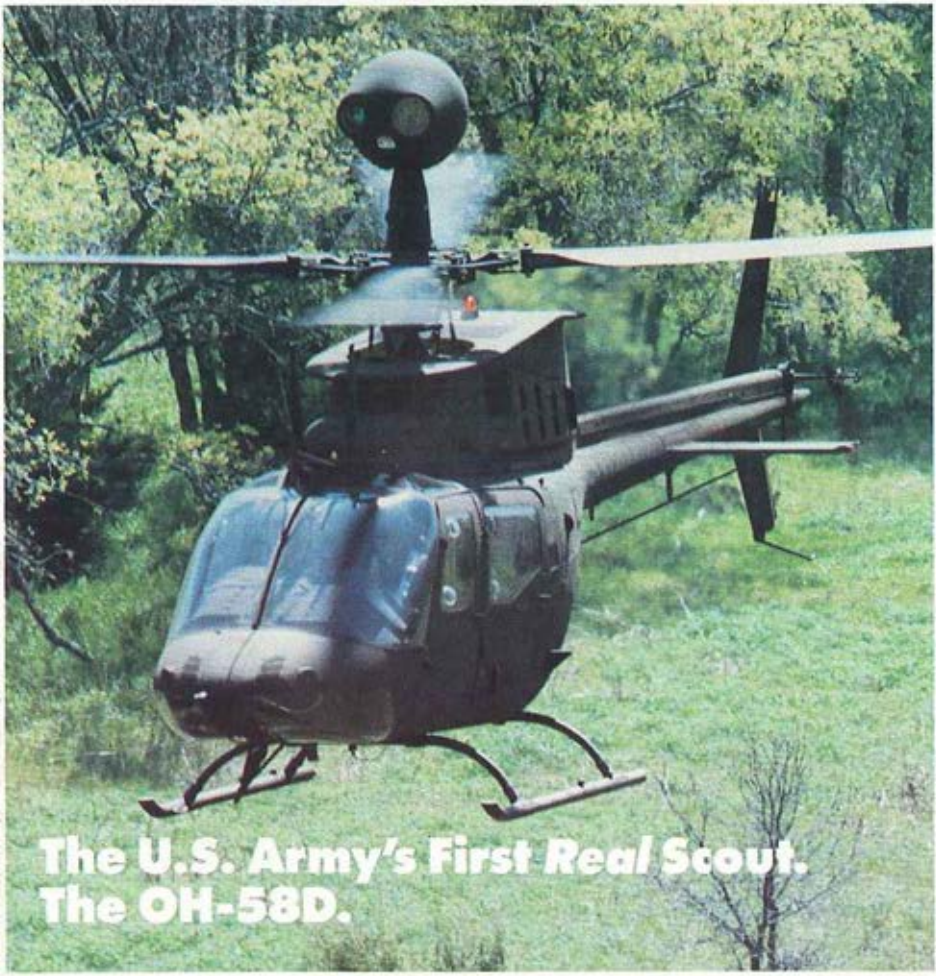

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Aviation Branch: On the Move!

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

Since this is my first byline of the new year, I want to pause to extend my gratitude to the men and women—both military and civilian—of the Aviation Branch for a most productive and exciting year. Without your professionalism, dedication, and enthusiasm, we would not have had the notable achievements in training, technology, and doctrine which have helped make us a significant player in the combined arms arena. I believe that 1988 will be as good, if not better, than 1987. Army Aviation's programs are moving ahead and it appears they will stay on schedule. I have selected three of those topics for this communique.

Our space mission

The first is our space mission, and the Directorate of Combat Developments (DCD) Space Technology Branch is the facilitator for that issue. DCD is conducting a Concept Evaluation Program (CEP) for nap-of-the-earth (NOE) satellite communications. Testing of the above program will be done by the Army Aviation Board. Test plans and start dates are to be determined by cost and delivery dates of the equipment.

In addition to this program, a Cost Operational Effectiveness Analysis (COEA) will examine the feasibility of a Global Positioning System (GPS). This system entails the placement in space of an array of satellites which will allow Army aviators to navigate successfully anywhere in the world.

Pilots, with the help of data from the satellites, will be able to pinpoint their positions within 10 to 15 meters, no matter where they might be. The GPS will provide reliable and continuous worldwide navigation for around-the-clock Army Aviation aircraft and ground operations. We believe that satellite communications and navigation will play an integral role in enhancing our mission performance.

The second topic is flight simulator training. We received the first UH-1 flight simulator at Fort Rucker in 1971. Since then, we have incorporated state of the art simulator technology into our trainers, giving us the world's most dynamic flight simulator training for rotary-wing aircraft. However, we are not resting on our laurels. We are constantly striving to upgrade this training—both in quality and cost effectiveness. An example of this is the Defense Advanced Research Agency's (DARPA) program known as AIRNET.

AIRNET will provide low cost tactical trainers to train aviators in pure and collective tasks. This is a safe, cost effective means of training aircrews under highly task-loaded conditions against a realistic/doctrinal interactive threat array. It will provide company and battalion level tactical training for attack helicopters and air cavalry units in a simulated combat environment.

On 1 September 1987, AIRNET prototype development began, and delivery of the generic prototypes to Fort Rucker is scheduled tentatively for November 1988. We here at USAAVNC believe the AIRNET program will do much in the training of qualified scout/attack pilots and will refresh and sustain aviation team training.

Regimentation

Thirdly, as of the end of 1987, 25 of our 32 aviation regiments have been activated, including seven at Fort Rucker. The activation should be completed by the end of 1988. I can't help but notice how much esprit, dedication, and professionalism have been enhanced since we began this process. Now, Aviation Branch men and women will belong to regiments that have been part of our great aviation and Army heritage. This sense of belonging provides a strong link between Army aviators of yesterday, today and tomorrow.

Finally, I want to reflect briefly on our Brigade

(Branch — Continued on Page 82)

We designed RAM/ILS/MANPRINT into our engine from the start, then we went the extra mile. Continually verifying and refining our T800-APW-800 engine in the field. Because when our challenge is to set new standards for engine reliability, availability and maintainability, your best advice comes from the Army experts who are going to use and maintain it.

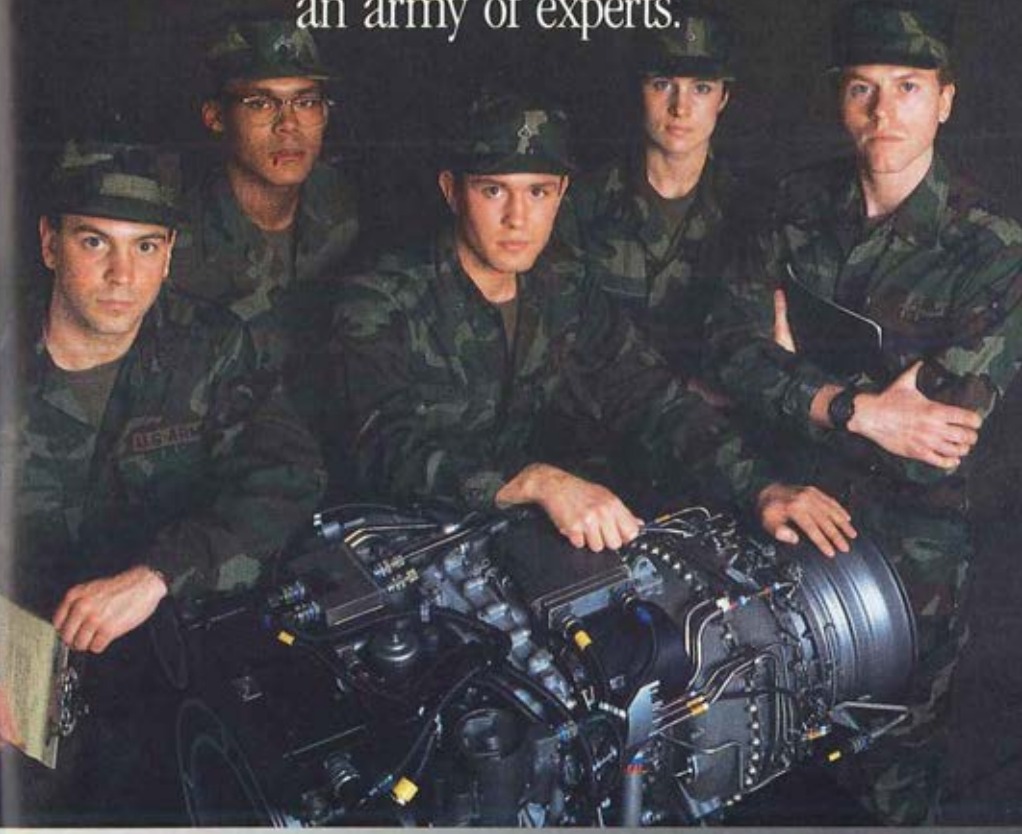
That's why the APW team took its mock-up to Army installations across the country. From Ft. Rucker to Ft. Campbell. Ft. Eustis to The Corpus Christi Army Depot. Army mechanics and maintenance officers validated our engine and gave us valuable insights.

This maintainability tour has prompted numerous design changes. Like a repositioned emergency lube system accumulator to improve compressor linkage access. And moved airframe-to-computer connectors for easier access.

Combine these design enhancements with the efficiency of one wrench size for all LRU's and advanced technology diagnostics, and the result is the most reliable, maintainable engine in the Army's inventory. One that provides more power with less maintenance and training; fewer support troops, parts and tools.

But you don't have to take our word for it. Just ask the experts.

When it comes to MANPRINT, this T800 engine team has recruited an army of experts.



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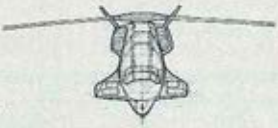
Boeing Sikorsky is first in LHX technology—first in the air with ACAP, an all-composite helicopter; SHADOW, a research helicopter that evaluates pilot workload reduction; and ADOCS, a fiber-optic flight control system.

Boeing Sikorsky is developing a lightweight, highly

maneuverable and agile design which will allow the LHX to win in the nap-of-the-earth and air-to-air combat environments. The foundation of this Boeing Sikorsky weapons system is the optimum mix of signature reduction and aircraft survivability equipment (ASE) technologies. These technologies will ensure that the LHX will survive and win on the battlefield.

First Team members have accepted the LHX challenge and are designing a fully integrated weapons system. A key element of the Mission Equipment Package is the helmet-mounted display (HMD). The HMD uses advanced electronics and fiber optics to superimpose critical flight, sensor and weapons data on the pilot's view of the real world, enabling him to detect, acquire and destroy threats.

It's these technologies that will enable the Boeing Sikorsky LHX to fight, win and survive to fight again.



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Hardware:

Conventional Design for LHX is Reaffirmed

by Lt. Colonel Arnold E. (Sandy) Weand

ST. LOUIS, MO — An advanced technology conventional helicopter has been reaffirmed by independent analysis as the best airframe technology for the LHX program. Two independent assessments recommended a new conventional helicopter as the best way to more closely meet the stated requirements for LHX. This new design conventional helicopter is also the most cost and operationally effective alternative.

If you recall my article in the August/September 1987 issue on the LHX Secretary of Defense Decision Memorandum, I mentioned that the Under Secretary of Defense for Acquisition had directed two independent studies assessing the various airframe technologies possible for the LHX. These studies were to be completed with final analysis and recommendations presented to the Army and DOD officials in November 1987. He also directed the LHX Defense Acquisition Board to continue upon completion of the independent studies.

While the Defense Acquisition Board supported the need to upgrade the Army's aviation capabilities, particularly the light attack role, they had concerns about the Army's position that the LHX should be a conventional helicopter rather than an advanced configuration aircraft.

LTC Weand is Logistics Staff Officer, LHX Project Manager's Office, AVSCOM, St. Louis, MO. The author wishes to thank LTC Joe Bergantz and LTC Art Armour, the LHX Program Manager's Liason Officers, for the independent studies, to RAND and IDA for their assistance.

RAND/IDA

Based on the Under Secretary's directive, the RAND Corporation and the Institute of Defense Analyses, or IDA were awarded contracts to undertake the six month study to assess the alternative air vehicles having potential suitability to meet the LHX requirements.

The air frame alternatives were originally defined as:

Possible LHX Airframes

- **Constrainted conventional helicopter**
- **Unconstrained conventional helicopter**
- **Unconstrained tilt rotor**
- **AH-64 upgrade**
- **Advancing Blade Concept helicopter**
- **X-wing Concept Aircraft**

However, the Advancing Blade Concept, and X-Wing Concept were quickly found to be too high risk and not viable alternative concepts for LHX. The technical and operational aspects of the remaining alternatives were thoroughly investigated. These comprehensive investigations and analysis included all pertinent/related factors such as the threat, mission equipment, design drivers, and cost.

Methodology

As two independent studies, the assessment methodology was different for RAND and IDA. Generally, each team reviewed investigations and analysis previously completed by both Army and industrial agencies. Both were updated on current aviation tactics and employments concepts and participated in day and night flights in current Army helicopters and the Bell XV-15 Tilt Rotor Demonstration Aircraft. At the same time, each team made extensive use of computer models to evaluate combat effectiveness.

The Army's preliminary design group at the Army Research and Technology Activity (ARTA) at NASA/Ames produced designs for the alternative configurations for use by both teams. This allowed the study teams to determine design sensitivity by vary-

(LHX — Continued on Page 81)

"This recommendation (that the LHX be a new development conventional helicopter) is based on operational effectiveness and lowest 20 year operational costs."

Operations:

V Corps Aviation Brigade Update

by LTC James E. Johnson

APO NY — The 12th Aviation Brigade has just completed FY 1987, a year of transition from an aviation group to the V Corps Aviation Brigade.

On October 16, the 12th Aviation Brigade was formed. At that time, the 11th Aviation Battalion and the 62d Aviation Company were deactivated and replaced by the 5th Battalion, 158th Aviation Regiment. The two other companies, the 48th Assault Co. and 295th MHC, also previously in the 11th Aviation Battalion deactivated and reformed as separate companies under the Brigade headquarters. The 295th became B Co., 6th Bn, 158th Avn Regt and the 48th became C Co., 7th Bn, 158th Avn Regt. The 5th Bn, 158th Avn Regt also separated its HHC maintenance platoon and formed a 5th company, E Company. This company will provide maintenance support to A, B, C, and D flight companies. The new wiring diagram is shown below in Figure 1.

LTC Johnson is the V Corps Aviation Brigade Executive Officer, APO NY.

Since there are no active duty battalion headquarters for B 6/158th and C 7-158th, they report directly to the brigade XO. Although it would appear that this is an awkward command and control arrangement, we are attempting to operate within the current LTOE.

12th Avn Bde Maintenance

The 12th Aviation Brigade must be able to fight within its General Defense Plan. Good maintenance programs guarantee the availability of combat equipment with which to fight. In addition, good programs train our personnel to do their jobs in peace or war and ensure the availability of equipment for training. To this end, we ensure that our "green suit" maintenance personnel are available to perform their mission along with our respected civilian "tech reps" and sample data collection personnel.

Brigade units continue to exceed DA availability rates. Mr. Joe Cribbins, Chief, Aviation Logistics Office, commented that the C 7-158 (MHC) has "the best CH-47 maintenance program..." that he's seen. Additionally, while performing a special mission 2000 miles from Wiesbaden, B 6-158 (Aslt) has managed to maintain 97% mission aircraft availability.

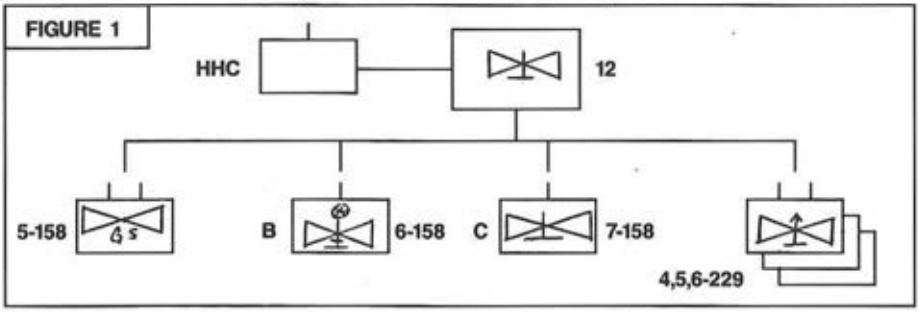
Operations

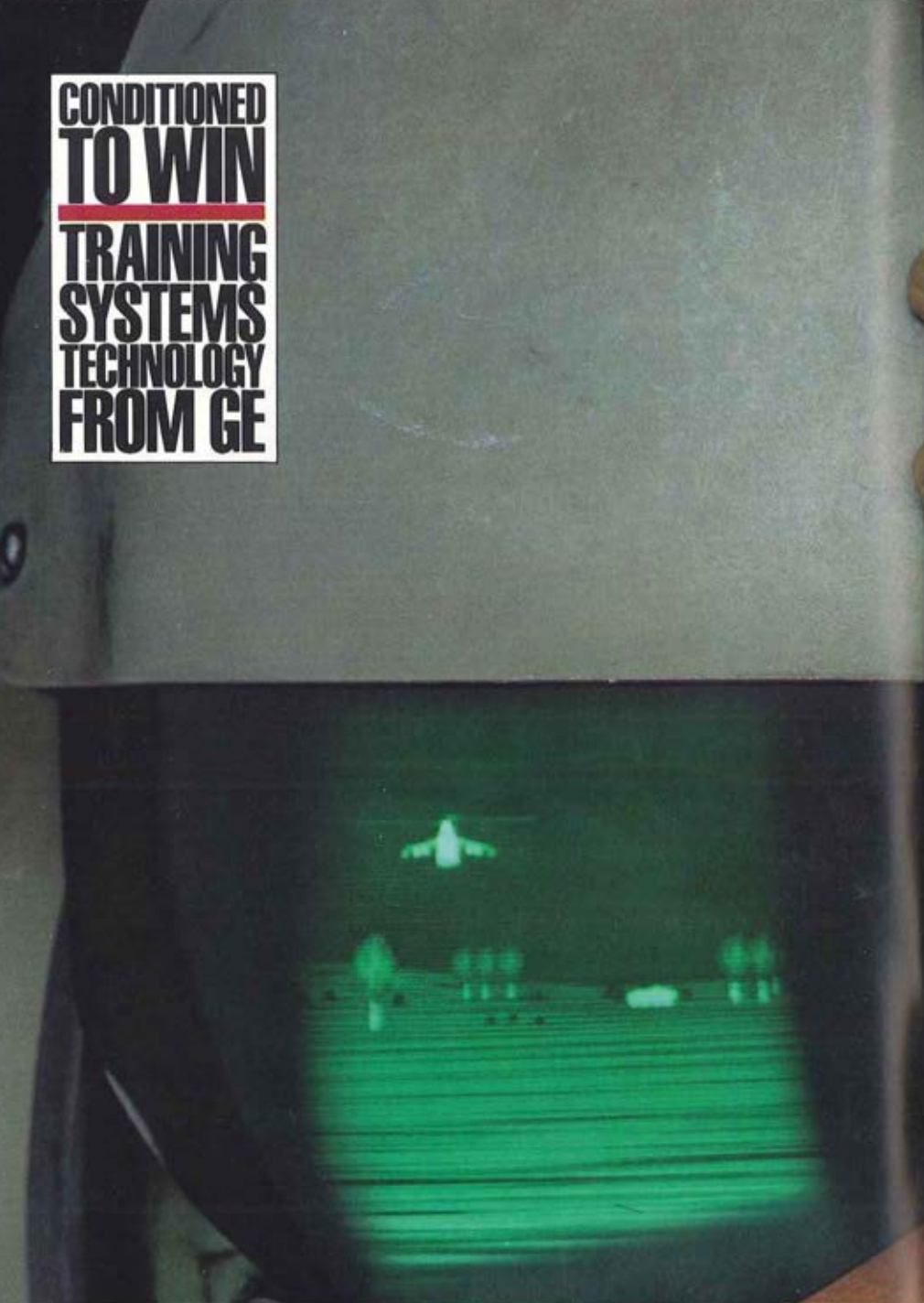
Operationally, the 5th Bn, 158th Avn Regt continues to perform its wartime and peacetime mission of providing command and control to the V Corps commander and staff. The battalion flies an average of five planned support missions each day. As in the case of most command and control units, "short fuse" missions are common, standby aircraft and crews are always on alert, and the weather never cooperates. Through it all the battalion flew 6,912 accident free hours last year.

B Co, 6th Bn, 158th Avn Regt (MHC) continues to provide the CH-47 support for V Corps. As previously mentioned, the unit has excelled at maintenance. In addition, it excelled in the areas of supply and was chosen to represent V Corps in a USAREUR-wide unit competition.

(V Corps — cont. on page 78)

FIGURE 1

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FLIR Target Imagery by COMPU-SCENE IV.

For more information contact:
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TRAYLOR

— AVIATION BRANCH INTERVIEW —

CSM John P. Traylor

Aviation Branch Command Sergeant Major and Command Sergeant Major, USAAVNC & Ft. Rucker

conducted by SFC (P) William C. Hawkins

HAWKINS

Sergeant Major, now that you have been in the job for about seven months, I'm sure you're aware of the ongoing changes in our young branch both in people and technology and I'm sure you've formed some ideas on where we are and where you think we should go. Today I would like to discuss some areas of interest and I have, for the sake of brevity, listed by subject areas; General, TOEs, CMFs, 28 67 and 93, in that order.

General

Q: *As the Branch CSM, what are some of your goals to improve Enlisted Personnel Management Systems within the branch?*

A: Two of the major areas I want to work on are getting our soldiers to school, especially BNCOC. This is mainly a twofold problem of:

a. The STRAMS-E II report is not always accurate. We must do all we can to insure the data base is correct.

b. There continues to be the problem with soldiers being released for school. Commanders and CSMs/1SGs must insure that the soldier is released even if he/she "is too critical to the unit mission" at the time of selection. Also within the Branch we have approximately 20 0-6 level commands. Of those 26 approximately 8 of the CSMs are from aviation background. The other 18 or 70% are filled by CSMs from other backgrounds. To be competitive for higher levels of command you need at least one 0-6 level job. We need to fill these positions with aviation background CSMs, so we can develop our people for positions of increased responsibility.That is not to say that the CSMs from backgrounds other than aviation haven't been doing a good job. They have, they have been instrumental in the healthy growth of our branch and are to be commended. It's just that we've got to begin preparing our CSMs for higher levels of responsibility.

Q: *What is the status of the NCO Academy, and is the Commandant going to continue "dual hat" as the Director of Enlisted Training?*

A: The NCO Academy is organized and will be live in for both ANCOC and BNCOC. The Commandant will be held responsible for Enlisted Training under the supervision of myself and the Branch Chief (MG Ellis D. Parker).

Q: *Do you ever see Ft. Rucker becoming a "one center training center" for Aviation?*

A: Possibly by the year 2000. Right now it is not a "front burner" issue; the major factor being facilities which equates to money.

Q: *There is a problem with female 77F POL Handles. When they become pregnant we can't use them due to danger to the fetus. Can anything be done? Maybe an ASI for refueling aircraft?*

A: This should be forwarded from TOE units experiencing the problem to the Logistics School at Ft. Lee.

Q: *When do we get the new nomex?*

A: We are projecting 1990 as a fielding date.

Q: *Why doesn't aviation have doctrinal proponency for those cavalry squadrons that are part of Aviation Brigades?*

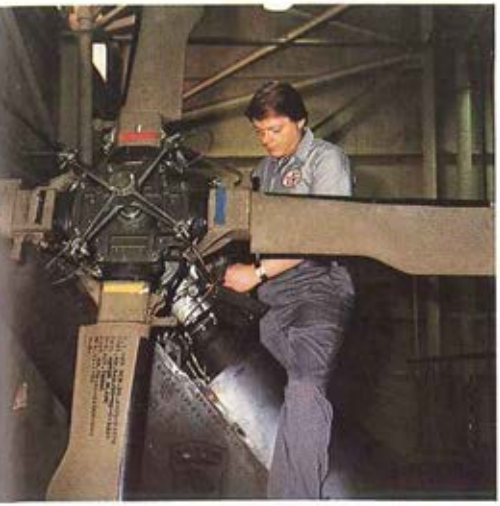
A: The Proponent for cavalry tactics is the Armor Center who must integrate air, ground, and mechanized cavalry operation in combined arms tactics. We have impact, and interface with Ft. Knox, but they retain proponency.

Q: *The T53, L13 and 15 engines in the UH-1 are going to be around for quite some time, yet, we must purchase no new engine parts. Don't you see this as a negative safety factor in the future?*

A: AVSCOM is currently working this issue to procure replacement parts to maintain the fleet (5 year plan).

Q: *What is the status of the enlisted pilot?*

Maintaining America's Readiness



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Expertise and experience—a potent combination.

A: The program is still being looked at. I personally do not agree with the program. I can see it creating problems of control and development for 1SGs and CSMs, particularly in the area of duties as an NCO and how they apply as a pilot.

Q: *Do you feel that our technology is advancing too fast for our ability to maintain equipment in the tactical environment?*

A: No, maintainability procedures are part of the new technology (MANPRINT).

TOEs

Q: *Why don't AVIM companies have an operations section authorized?*

A: A recent change to AOE TO&Es authorized an operations section, to alleviate the problems of flight records management.

Q: *Why in both J&L series TOEs are the MOS requirements for light wheeled vehicle drivers in Battalion HQs and HHCs 93P & 67V?*

A: Manpower constraints in low density MOS; these personnel perform duties as drivers.

Q: *Why not have a capper MOS at E8 and force E7(P)s to make a choice; staff/technical or leadership track?*

A: Technical and tactical proficient leaders through CSM is the goal of the AOE.

Q: *Everyone understands that "money drives the train" but our TOEs are becoming too restrictive to perform a peace time mission much less go to war. What can be done?*

A: TO&Es are manned at levels below "go to war" strength due to budgeting and nonavailability of manpower. NCO's must be proficient in how to train soldiers. This will be a focal point when TO&Es are increased in the event of a conflict.

Q: *The formula used to generate the number of maintainers is X number of aircraft = X number of maintainers using the Manpower Allocation Resources Chart (MARC). Yet, due to a shortage of maintainers the aircraft OR rates are short of what they should be. Example: The OR rate requirement for AH-1s is 70% but the FORSCOM average for the period of Oct 86-Jun 87 is 63.55% for FMC. Has this been addressed?*

A: Yes, current TO&E were manned using MACRIT standard. MARC should give a 30-40% increase in (good) personnel in J&L TO&E.

Q: *Why do TOEs reflect an operations platoon and yet the 93P E6/7 is called the operations sergeant? Why not platoon sergeant? This would make him/her more competitive with the 67 series contemporary?*

A: He is already competitive, (AR 611-201) at E6/7 level is an operation NCO.

CMF 28

Q: *Now that we have proponency for CMF 28 will we get the school moved to USAAVNC?*

A: Yes, we're looking at accomplishing the move in the FY 91-92 frame.

Q: *What about ANCOC?*

A: We will have the CMF 28 ANCOC at Ft. Rucker by 1 October 1989.

CMF 67

Q: *Can we increase the amount of platform instruction received at the school? This would decrease the amount of time needed to "train up" the soldier at unit level.*

A: 97 hours are currently lock-step, conference type class. We're going to group pace instruction on the floor to gain more instructor/student time as they process through the school. Budgetary problems prevent increase in course lengths.

Q: *When we perform maintanance on the aircraft we must always have "the book" open to the correct page. Why then, are portions of the SQT expected to be committed to memory? We also need more time to accomplish the test.*

A: CAC in conjunction with TRADOC HQ is relooking at the entire SQT systems and results of the study will be presented to TRADOC Commander in 3rd quarter of FY 88.

Q: *Why do the cut off scores for promotions to E5/6 remain so high when we seem to have a shortage of people in those grades?*

A: The current strengths are 96% for E5 and 102% for E6.

Q: *With the UH-1 projected to remain in the fleet well past the year 2000, and the 67N being promoted to 67T at E7, who will supervise the maintenance of the Huey fleet?*

A: The 67T40. His track at ANCOC includes both the UH-1 and UH-60 aircraft.

(CSM Traylor — Continued on Page 81)

Enlisted Note:

Sergeant Major Walter Cole has assumed the duties of Total Army Personnel Agency Aviation/Transportation Branch Sergeant Major.

Congratulations, SGM Cole!

T700/CT7

MORE

At GE Aircraft Engines, we're committed to more for our customers. That's why our latest T700 derivative engines, being delivered this year, provide more power with more technology. And, because they are built upon the highly successful fleet of current T700s, they offer more of what's important: proven reliability, maintainability, ruggedness, readiness and mission performance. They also provide greater helicopter compatibility and logistics commonality so our customer gets more savings and more value. Maybe that's why T700s power more helicopters!

GE Aircraft Engines

Survivability:

Aircraft Survivability Equipment

by Colonel James R. Holder

ST. LOUIS, MO — Aircraft Survivability Equipment (ASE) continues to expand in its application to the Army's growing aviation fleet. Technological advances and the increase in number and capabilities of threat systems are driving factors in the research, development and fielding of new Army ASE systems.

In the last few years the many ASE fieldings have greatly multiplied the combat power of our aviation units in USAREUR, EUSA, SOUTHCOM and FORSCOM. Nowhere is ASE's importance realized more than in OCONUS theaters. ASE's presence in EUSA and USAREUR is evidenced by recent hardware fieldings which resulted in significant upgrades in Army aviation readiness and war fighting capabilities.

There are currently two major types of countermeasure systems fielded to OCONUS units. These are primarily radar and infrared countermeasures systems.

Radar Countermeasure

Radar Countermeasure systems include the AN/APR-39 (V) 1/ (V) 2 Radar Detecting Sets which detect pulse radars normally associated with surface-to-air, airborne intercept, or antiaircraft weapons. Also included are the AN/ALQ-136(V)1/(V)2/V5 Radar Jammer Sets which receive, analyze, and automatically jam incoming radar signals emitted by the most critical threat weapon systems an attack helicopter may encounter in hostile environments.

The AN/APR-44(V)1/(V)3 Radar Warning Systems provide detection and warning of the continuous wave radar illuminators of upper and lower hemisphere threats.

The chaff mode of the M-130 General Purpose Aircraft Dispenser when used in conjunction with radar warning receivers and aircraft tactics and maneuvers also provides survivability enhancement by causing radar break locks.

Infrared Countermeasure

Infrared Countermeasure systems enhance survivability against heat seeking infrared weapons and include the AN/ALQ-144(V)1/(V)3 Infrared Countermeasure Sets which provide jamming of threat infrared missile systems when installed on rotary wing aircraft equipped with appropriate reflective paint and engine exhaust suppressors.

The AN/ALQ-147A(V)1/(V)2 Infrared Jammer is a rear-aspect, fuel fired set specifically designed for Army fixed wing Special Electronic Mission Aircraft (SEMA).

The AN/ALQ-156(V)1/(V)2 Missile Approach Detector provides protection against present and near term infrared homing missile threats by triggering the M-130 Dispenser System. The M-130 then releases a flare to decoy an infrared seeking missile away from the aircraft.

Other infrared ASE includes suppressors which reduce engine infrared emissions thereby reducing the detection, acquisition, and tracking of aircraft by heat seeking missiles.

Fielding

Unlike earlier fielding of ASE during the Vietnam era when little testing was accomplished before being delivered to OCONUS units, extensive testing is now conducted both in the materiel development and the user community. Increased emphasis on system support packages, supportability and planning has minimized support and readiness issues normally experienced during initial installation of new ASE in the field.

The ASE PMO recognizes the inconvenience caused in installation of kits and systems at unit/depot level, but survivability of man and machine and the increased war fighting capability afforded by use of ASE in volatile regions of the world dictate that ASE be fielded as quickly as possible.

Training

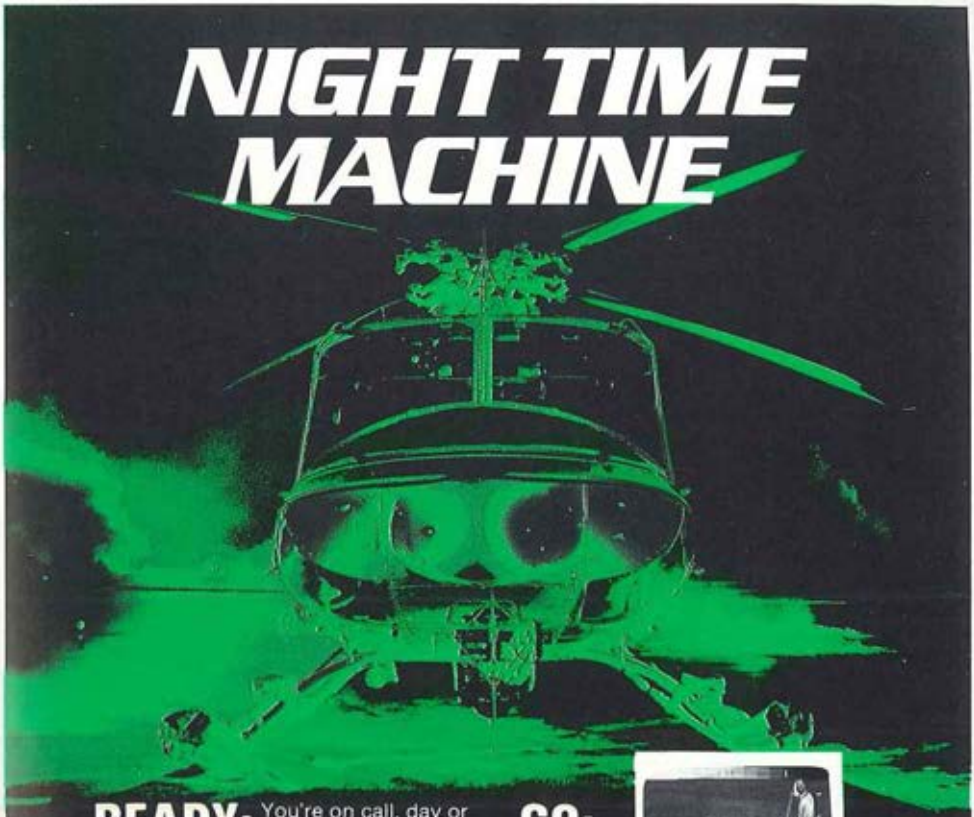
In recognition that the biggest payoff in survivability is achieved primarily through the proper execution of sound tactics, my office has been working closely with the Aviation Center to improve ASE training. The ASE Trainer I (ASET I) is in place.

Three contractors were recently competing for the contract to produce the ASET II. After a rigorous source selection process,

(ASE — cont. on p. 86)

Colonel Holder is Project Manager for Aircraft Survivability Equipment (ASE), AVSCOM, St. Louis, Mo.

NIGHT TIME MACHINE



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Operations:

Ever Watchful Regimental Activation

by Captain Vernon L. Campbell

HUNTER AAF, GA — Effective 17 October 1987, the 24th Aviation Regiment became a reality with the activation of the 1st Battalion, 24th Aviation (Attack Helicopter), Co D, 24th Aviation (Genral Support), Co E, 24th Aviation (Combat Support) and Co F, 24th Aviation (Intermediate Maintenance).

The Regiment whose lineage dates back to October 1942, was formally welcomed to the 24th Infantry Division(Mechanized) in a ceremony full of pomp and circumstance at Hunter Army Airfield, Georgia, on 5 November 1987.

The 24th Aviation Regiment is extremely proud to have as the Honorary Commander COL (Ret) Thomas H. Spence and as the Honorary Command Sergeant Major CSM (Ret) Ruck Tipton, Sr.

Both gentlemen have been aviators from the beginning of the Army Aviation and readily accepted the invitation to the honorary position without hesitation.

Honorary Commander

During COL Spence's illustrious career, he graduated from the first flight training class conducted by the U.S. Army at Camp Gary, Texas, in January 1957. Additionally, he served as Battallion Commander of the 77th Artillery (ARA), 101st Airborne Division in June 1969, one of two AH-1 Cobra Battalions the Army had in Vietnam at that time. COL Spence next commanded 1st Cavalry Division Artillery, Ft Hood, Texas, in December, 1975. COL Spence capped his career in May 1979 as the Assistant Division Commander-Support of the 24th Infantry Division (Mechanized).

Captain Campbell is Assistant S1, Aviation Brigade, 24th Infantry Division (Mechanized), Hunter Army Airfield, GA

"We welcome those soldiers, enlisted through officer, who have served with the 24th Aviation to affiliate with the Regiment and rejoin this proud organization."

Honorary CSM

CSM Tipton qualified as a UH-1 Crew Chief in 1965. CSM Tipton was promoted to E-5, E-6, and E-7 in 1966, 1967, and 1968 respectively showing his extraordinary potential. CSM Tipton's affiliation with the 24th began with assignment as First Sergeant, Company B (GS), 24th Aviation Battalion. His career was capped with promotion to SGM while assigned as the Senior Enlisted Member of the AH-64A Operational Test II.

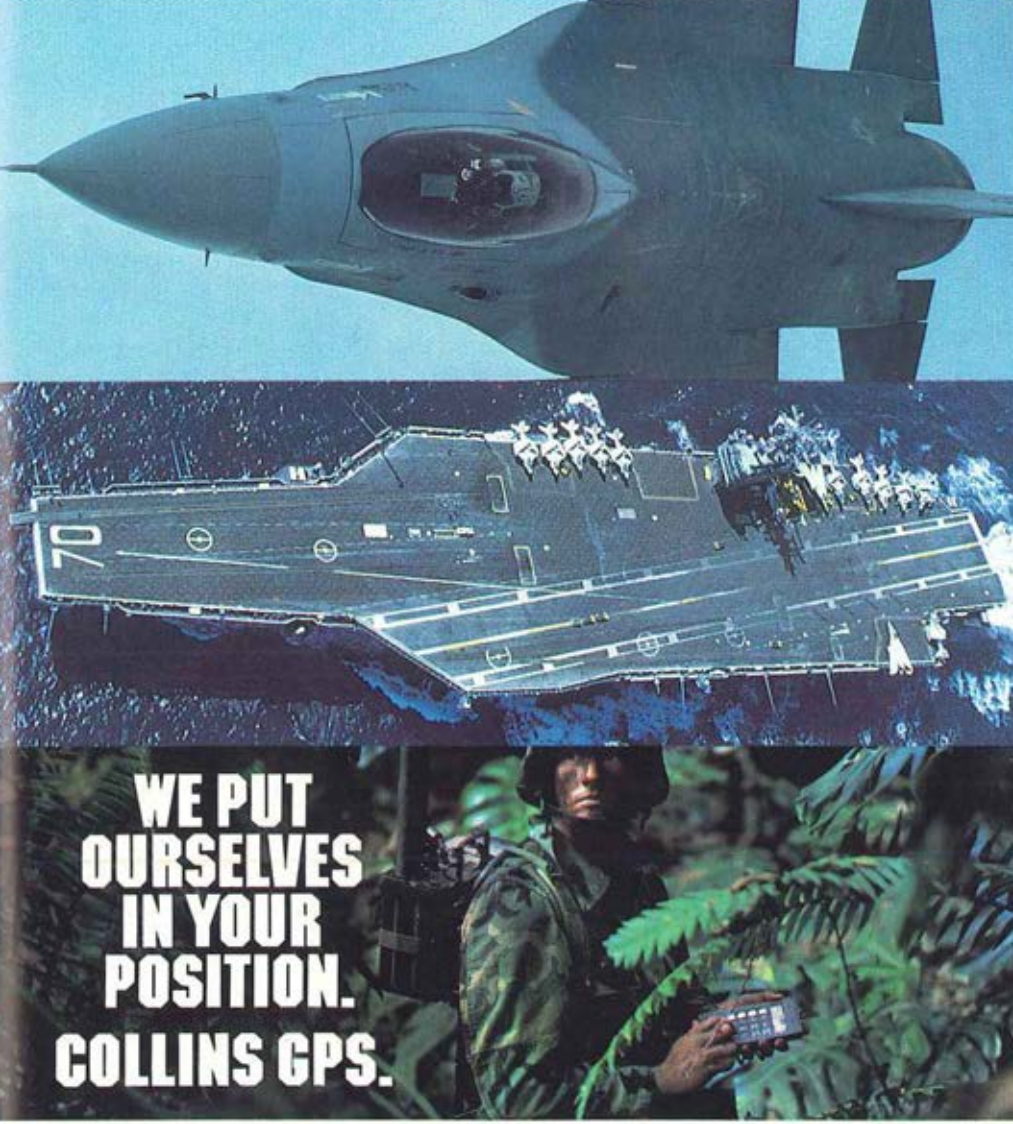
The 24th Aviation Regiment contains one Attack Helicopter Battalion and three separate companies. The 1st Battalion, 24th Aviation, "The Vipers", commanded by LTC William R. Clontz, provides attack helicopter support to the 24th Infantry Division (Mechanized). Company D, 24th Aviation, commanded by MAJ Michael L. McGary provides general support to the Division.

D Company was the AAAA Outstanding Aviation Unit of the Year for 1986 and also the winner of the FORSCOM Commander's Safety Trophy for two quarters in 1987.

Company E, 24th Aviation, commanded by CPT Michael N. Lehman utilizes the UH-60A Blackhawk and provides combat support aviation for the Division. Company F, 24th Aviation, commanded by MAJ Kevin T. Colcord provides intermediate maintenance support to the Division's aviation elements.

The regiment has a proud history, distinguished leadership, and units with the desire to excel. We welcome those soldiers, enlisted through officer, who have served with the 24th Aviation to affiliate with the Regiment and rejoin this proud organization.

Soldiers, active or retired, can write for further information by contacting: **Adjutant, 1st Battalion, 24th Aviation Regiment, Humter Army Airfield, Georgia 31409.** IIII



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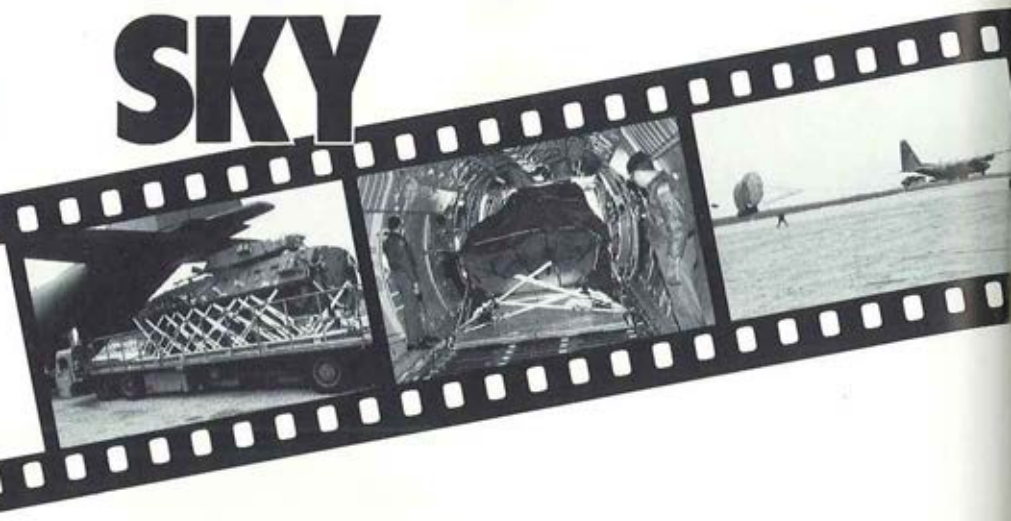

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Combat Developments:

Aviation Logistics Update

by Lt. Colonel Thomas P. Cole

FT. EUSTIS, VA — As the Army moves toward the year 2000 and reaches closer to the acquisition of the LHX, the aviation planners must cope with a revolutionized battlefield. This new battlefield offers renewed challenges to the Aviation Logistician to keep pace with the operational arm of Army Aviation.

To keep up with this momentum, the Directorate of Combat Developments at the Aviation Logistics School has had several recent successes as it strives to accomplish its proponent mission as the combat developer of all aviation ground support equipment for Army Aviation.

First Step

The first step to accomplish that mission is to understand the modern battlefield and the threat capabilities where we will be called to work. Until recently the school had to rely on outside sources to do this. Within the past year the directorate hired a Threat Manager who is charged with the responsibility of advising the Director about threats against personnel, aircraft and equipment. This section also reviews the applicability of threat to all facets of force modernization and administers threat training programs throughout the school.

In the Concepts and Studies Division, we have spent the last few months interviewing aviation command, staff, and technical personnel from corps/division units in FORSCOM, WESTCOM, and USAREUR to determine the best way to support the Aviation Brigade. The information gathered will be used by USAALS in a staff study to document specific problems, arrive at conclusions, and if appropriate, provide recommendations for improvement in CSS to the newly formed Aviation Brigades. The final report for the study is due in February 1988. Look for an article on this important study in ARMY AVIATION MAGAZINE.

Recent Developments

There have been several recent initiatives in the hardware area that the school can call success stories. First is the Tactical Aircraft Maintenance Platform (TAMP) which was initially reported to you in the July 1987 edition of ARMY AVIATION. The TAMP is essentially a lightweight folding ladder, capable of being folded into a variety of configurations which will provide the mechanic an easy-to-maneuver, lightweight maintenance platform.

Testing on this system is complete and we are convinced that this 17 foot ladder fully satisfies the TAMP requirements document. The school has requested that AVSCOM add this ladder, NSN 5440-01-048-8368, and the associated work platform, NSN 5440-01-092-1812 to both the divisional and non-divisional aviation shop sets. Additional information on this ladder and work platform have appeared in the July-August 1983 Army Logistician, June 1983 FLIGHTFAX, and the June 1983 PS Magazine.

UMARK

Another initiative the Direc-

(Logistics — Cont. on page 78)

LEFT: An example of the Tactical Aircraft Maintenance Platform (TAMP) in use at Ft. Eustis.

LTC Cole is Director of Combat Developments at the Aviation Logistics School, Ft. Eustis, VA

Recognition of a job well done.

For 350 years, the National Guard has come to our nation's aid in times of war and in times of natural disaster. But no amount of determination and valor can overcome the limits of their equipment.

Right now the Guard is flying helicopters rendered obsolete a decade ago—with the introduction of the U.S. Army BLACK HAWK to the active forces. Today the UH-60A BLACK HAWK is the most effective and mission flexible helicopter in the air, the standard for our nation's Army.

It's the vehicle of choice because it's nimble, flexible and powerful. Armed, it performs as an assault helicopter. But on the other hand, it has the muscle and flexibility for serious disaster-relief work. It'll fight fires; carry supplies; and save lives in search and rescue and medevac missions.

The Guard, as part of the total force structure, needs the same equipment used by the active Army.

Simply put, the BLACK HAWK is the best there is. And the National Guard doesn't just deserve the best.

They need it.

UNITED TECHNOLOGIES
SIKORSKY AIRCRAFT

Operations:

Light Fighter Aviation: Life after certification

by Major Frank T. Taddonio

FT. ORD, CA — The Combat Aviation Brigade, 7th Infantry Division (Light) along with the entire division completed a rigorous certification exercise during August 1986. During this historic exercise, Celtic Cross IV, the Brigade's aviators flew in excess of 2,500 hours while the units averaged 88% mission capable aircraft.

Although "certified," the evolution of the Brigade's organization and equipment and the development of doctrine did not cease to progress. We became rapidly aware that the upcoming year would be as demanding and challenging as that leading up to certification.

On September 29, 1986, command of the Combat Aviation Brigade passed to COL William A. Hall, III. Three weeks later, COL Hall deployed the brigade headquarters to Ft. Hunter-Liggett in support of 3d Brigade. This was the beginning of what has become an extraordinarily busy year.

Bold Venture

While the light infantry division has been formed to rapidly deploy to counter low intensity threats, the CAB, along with the Division, had to re-orient its focus to participate in Bold Venture, an I (US) Corps CPX. This exercise, set in a mid-high intensity environment, greatly emphasized the importance of the firepower and mobility that the CAB provides to the division. This exercise also provided the brigade an opportunity to operate as a maneuver brigade since it was task organized with ground forces and given an offensive mission.

As Task Force 5-21 (formed around 5th Battalion, 21st Infantry) prepared for deployment to the MFO in the Sinai, the CAB provided the required aviators, crewchiefs, and other qualified personnel to support this important mission. The force was fenced in December, deployed in April, and personnel completed redeployment by the end of November 1987. A key aspect of this deployment was the transition from a rotational basis for aviation support to a PCS status. All of these personnel gained a great deal of valuable experience concerning aviation operations in a desert environment.

NTC

Once again, the Brigade's aviators had to focus on operations in a mid to high intensity environment as a task force was organized to deploy to the National Training Center. TF 307 formed around the 307th Attack Battalion, deployed with a Regimental Combat Team of the 9th Infantry Regiment.

In addition to the attack battalion, its elements included an assault helicopter company, reconnaissance elements of 2-10 Recon Squadron, brigade level support (Class I, III, V, and communication), 4/57th ATC, weather support, an air defense battery, and AVIM support from 536 TAMC. The task force supported nine force on force tactical missions and successfully flew in excess of 1100 hours and drove over 65,000 miles.

CPX

The Division's annual FTX was scaled back to a CPX conducted at Ft. Hunter-Liggett in May. However, the CAB deployed all of its assets to the field to capitalize on the training time. A unique aspect of this exercise was a daily tactical tutorial covering various doctrinal subjects. These were attended by all commanders down to battalion level. A superb presentation outlining the planning, coordination, and execution of air assault missions was well received by all participants.

Dragon Summit FTX

After a very busy period of reserve component annual training evaluations, the brigade deployed once again to Ft. Hunter-Liggett. During August, 9th Regiment's Dragon Summit FTX provided another excellent training vehicle for the CAB.

The exercise enabled the Brigade to incorporate the 336th Aviation Battalion, a reserve unit from Los Alamitos, CA, into the task organization. The integration of active and reserve components under one brigade headquarters was a unique opportunity which proved successful. Also, significant progress was achieved between 9th Regiment and attack battalion in developing procedures for the conduct of Eagle Strikes.

Major Taddonio is Executive Officer, Aviation Brigade, 7th Infantry Division (Light), Ft. Ord, CA

"The Brigade's aviators flew in excess of 2,500 hours while the units averaged 88% mission capable aircraft"

As the end of 1987 approaches, the brigade has been involved in supporting external evaluations called Bold Thrusts. During each of these battalion level exercises, an air assault of an entire infantry battalion is planned and executed. These exercises will be conducted almost every other month.

The preceding activities have been completed while the Brigade's structure has changed both physically and, in some cases, in name. While certification validated many aspects of the light infantry division organization and structure, the Combat Aviation Brigade is still evolving into an optimum configuration Headquarters and Headquarters Company.

This configuration includes the normal staff complement capable of planning the full range of contingency operations and the necessary command and control for tactical operations. The company has an organic Class III/V platoon which provides all refueling and rearming for the entire brigade. The company's mess section supports all units except the reconnaissance squadron.

2-9th Recon

The 2-9th Reconnaissance Squadron (formerly 2-10 RS) is the eyes and ears of the division. The squadron contains a headquarters troop, two air cavalry troops (each has 4 AH-1S (ECAS) and 6 OH-58C aircraft), and a ground reconnaissance troop which has eight TOW's and twelve .50 cal guns all mounted on HMMWV's.

During the year, the LRSD (Long Range Surveillance Detachment) was moved from the squadron and attached to the division's military intelligence battalion. Also, the squadron controls three EH-1 aircraft for training and maintenance but they belong to the MI battalion.

1st Bn 123d Avn Regiment

The 1st Battalion 123d Aviation Regiment (Attack) (formerly 307th Attack Helicopter Battalion) contains a headquarters company, three attack helicopter companies (each has 7 AH-1S and 4 OH-58 aircraft) and a recently formed maintenance company.

The battalion is the primary tank killing capability of the division. It is currently transitioning all of its AH-1S aircraft to the ECAS version.

7th Aviation Battalion

7th Aviation Battalion (Provisional) (formerly two separate assault helicopter companies) includes a headquarters company, two assault helicopter companies (15 UH-60 aircraft each) and a maintenance company. The battalion is in the process of forming a general support aviation company with the assets of the C3 platoon (6 OH-58's), the 3 EH-1's in the recon squadron.

Another change in the brigade structure will occur soon as the division's aviation maintenance company will be moved from the DISCOM to the CAB. This will afford the brigade commander the ability to directly influence the priorities of the maintenance company since it will be attached as a separate company.

The future activities of the combat Aviation Brigade appear to be as exciting and challenging as the past. The brigade's units are preparing to participate in rotations at JRTC and NTC as well as the annual Division exercise, Celtic Cross VI.

LIGHTFIGHTER! IIIII

Personnel:

Flying Duty Credit: 1st, 2nd and 3rd Gate

by Major William G. Zorn, Jr.

ALEXANDRIA, VA — I continually receive questions on AR 600-105 as it pertains to Aviation Career Incentive Pay (ACIP) and the accumulation of Total Operational Flying duty Credit (TOFDC) in terms of the "gate" system. AR 600-105 indicates that there is a 12-year gate (the 1st gate) and an 18-year gate (the 2nd gate) but does not clearly point out that there is a second part to the 18-year gate — what I call the 3rd gate! AR 600-105 defines continuous ACIP as follows:

Army aviators qualified for aviation service are entitled to continuous ACIP for 12 years following Aviation Service Entry Date (ASED).

The Gates

The following gate system applies to those aviators that are entitled to continuous ACIP:

Gate #1. Those aviators who accumulate at least 72 months of TOFDC by the end of 12 years following ASED are entitled to ACIP through 18 years of aviation service (as long as they remain qualified).

Gate #2. Those aviators who accumulate at least 108 months of TOFDC by the end of 18 years following ASED are entitled to ACIP through 22 years of Total Federal Officer Service (TFOS) (as long as they remain qualified).

Gate #3. Those aviators who accumulate at least 132 months of TOFDC by the end of 18 years following ASED are entitled to ACIP through 25 years of TFOS (as long as they remain qualified).

Army aviators not entitled to continuous ACIP may receive monthly ACIP only while serving in an operational flying position IAW AR 570-1. An officer (other than a warrant officer) below pay grade 0-7 with over 25 years of officer service who is qualified for aviation service and required by competent orders to perform operational flying duties is also entitled to monthly ACIP. Monthly ACIP is handled by local Finance and Accounting Offices and not at the DA level. ACIP rates are the same for both categories (continuous and monthly):

Aviation career incentive pay
Commissioned Officers

Yrs of Avn Svc*	Monthly Rate
2 or less	$125
Over 2	$156
Over 3	$188
Over 4	$206
Over 6	$400
TFOS	
Over 18	$370
Over 20	$340
Over 22	$310
Over 24	$280
Over 25	$250

**Avn Svc for a commissioned officer includes flight training.*

Warrant Officers

Yrs of Avn Svc	Monthly Rate
2 or less	$125
Over 2	$150
Over 3	$188
Over 4	$200
Over 6	$400

ASED and TFOS

ACIP is based on two critical dates ASED and TFOS. Individuals who experience a break in service need to have these dates adjusted otherwise full ACIP entitlement may not be received. Individuals should forward requests for recomputation of ASED and TFOS to: Commander, Total Army Personnel Agency, ATTN: DAPC-PDT-RC, 200 Stovall Street, Alexandria, VA 22331-0476.

TOFDCs

An aviators TOFDC is reflected on the Officer Record Brief (ORB) in terms of months at a certain date. Input into this figure is automatic and generated by the Duty MOS (DMOS) of a particular assignment. It is important therefore to insure that individuals in a flying assignment have the proper DMOS reflected on their ORB and that 1X (flying prohibited) does not appear in this DMOS.

Computing TOFDC

TOFDC is recorded by number of months and begins the day following the date an aviator signs out of a nonoperational flying duty position enroute to an operational flying duty position. Credit is continuous until the aviator signs out enroute to a nonoperational flying duty position.

The 15th day of the month is the "break even" point for cre-

(Gates — cont. on p. 84)

Major Zorn is Chief, Aviation, Plans & Programs Section, OPMD, Total Army Personnel Agency.

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Operations:

The Red Devils: Eagle Brigade

by Colonel John C. Parrish

FT. POLK, LA — This first year has been exciting and challenging for the Aviation Brigade of the 5th Infantry Division (Mechanized). We have come a long way towards the goal of integrated combined arms in a very short period of time.

The challenges have been tremendous. We completely reorganized the structure of aviation at Fort Polk while at the same time we began training as a Maneuver Brigade with standard Heavy Maneuver Brigade missions.

The 5th ID(M) is currently being modernized across the board. Aviation is receiving its fair share of new equipment which enables the brigade to be a more formidable member of the combined arms team.

Reorganization

The brigade was activated on September 22, 1986 by permanent orders from HQDA. It is composed of the 4-12 Cavalry Squadron, the 5th Attack Helicopter Battalion, the 197th Assault Helicopter Company, the 117th Command Aviation Company, and a Headquarters and Headquarters Company.

4-12 CAV

The 4th Squadron 12th US Cavalry Squadron is organized under the Army of Excellence (AOE) with two ground cavalry troops and two air cavalry (AH-1S) troops. One of the ground cavalry troops, E Troop, 256 Bde, is a round-out unit serving with the Louisiana National Guard.

The squadron is commanded by LTC Albert F. Leister, Jr., with CSM Wiley M. Clark. The mission of the squadron is to conduct reconnaissance and security operations to the front, flanks, and rear of the division. They can also enhance command and control within the division.

5 AHB

The 5th Attack Helicopter Battalion is organized under AOE and was redesignated 5th AHB on September 17, 1986. The old unit was the 214th AHB and was moved from Fort Lewis, Washington to Fort Polk, Louisiana. This unit has three attack helicopter (AH-1F) companies and a headquarters and service company. The battalion is commanded by LTC William P. Dickens with CSM Robert E. Williams. The battalion mission is to destroy massed enemy armor force with aerial firepower, mobility, and shock effect.

197th AHC

The 197th Assault Helicopter Company was formed by combining the Aero Reconnaissance Platoon, D Troop 4-12 Cavalry, and the lift assets from the Division Aviation Company. It has 23 UH-1 aircraft. It is commanded by CPT Joseph Judge III with 1SG Joseph Garcia. The company's mission is to conduct air assault and air logistics missions to support deep attacks, pursuits, and other missions that require fast response.

117th CAC

The 117th Command Aviation Company was formed from the command and control assets of the Division Aviation Company. It consists of two command and control platoons, one UH-1 and one OH-58; and an aerial fire support platoon. It is commanded by CPT Reginald S. Whitlock with 1SG James R. Cosgrave. The company mission is to provide the division with aircraft for command, control, liason, and field artillery air observation.

Brigade HHC

The Brigade HHC was organized from the assets of the 5th Combat Aviation Battalion HHC. It is composed of the normal staffs found in a brigade level plus the division's airspace management element. It is commanded by CPT Joel D. Roberts with 1SG Fred Slavens. Its mission is to provide brigade level command and control for the Aviation Brigade as well as perform battalion level command, control, and logistics functions for the 197th AHC and the 117th CAC.

Aviation Brigade Training

During this first year, the brigade's challenge has been to function internally with the new organization while at the same time integrating the Aviation Brigade into division operations. The Division Command Group recognized that the brigade was

COL Parrish is Commander, Aviation Brigade, 5th Infantry Division, Fort Polk, LA.

recognized that the brigade was capable of performing several of the maneuver brigade functions. These included limited offensive, defensive, and economy of force missions.

Since activation, the brigade has participated in four Command Post Exercises (CPX), all of which saw the Aviation Brigade with ground maneuver task forces attached. The specific missions have included reconnaissance, defense in sector, and counterattack. In all cases the use of the Aviation Brigade as a Manuever Brigade allowed the division the flexibility to more efficiently utilize the Heavy Maneuver Brigades.

FTXs

Recognizing that Maneuver Brigade training is not complete without actual forces on the ground, the brigade has conducted three Field Training

(Devils — cont. on p. 79)

5th Aviation Regimental Activation

The 5th Aviation Battalion was first constituted July 20, 1940 in the Regular Army as the 5th Cavalry Reconnaissance Troop and assigned to the 5th Division (later redesignated as the 5th Infantry Division). It was activated August 10, 1940 at Fort Benjamin Harrison, IN reorganized and redesignated October 1, 1943 as the 5th Reconnaissance Troop, Mechanized; reorganized and redesignated March 4, 1946 as the 5th Mechanized Cavalry Reconnaissance Troop.

It was inactivated September 20, 1946 at Camp Campbell, KY redesignated July 6, 1948 as the 5th Reconnaissance Company and activated at Fort Jackson, SC. Inactivated April 30, 1950 at Fort Jackson, the company was activated March 1, 1951 at Indiantown Gap Military Reservation, PA. Inactivated September 1, 1953 at Indiantown Gap Military Reservation, it was activated May 25, 1954 at Augsberg, Germany and inactivated June 1, 1957 at Fort Ord, CA.

Converted and redesignated January 26, 1962 as Headquarters and Headquarters Company, 5th Aviation Battalion (organic elements concurrently constituted), the battalion was activated February 19, 1962 at Fort Carson, CO. (Headquarters and Headquarters Company, 5th Aviation Battalion, was reorganized and redesignated February 12, 1964 as Headquarters and Headquarters Detachment 5th Aviation Battalion, and Company A was inactivated June 25, 1966 in Vietnam). The battalion (less A Company) was inactivated June 24, 1967 at Ft. Carson.

Headquarters and Headquarters Detachment, 5th Aviation Battalion, was redesignated July 21, 1975 as the Aviation Company, 5th Infantry Division, and activated at Fort Polk, LA. Reorganized and redesignated September 1, 1982 as Headquarters and Headquarters Company, 5th Battalion (organic elements concurrently activated), the 5th Aviation Battalion and its organic elements were later deactivated, on September 17, 1986. On that same day, it was activated and redesignated as the 5th Attack Helicopter Battalion (5th AHB). The 5th AHB is presently assigned under the Aviation Brigade, 5th Infantry Division (Mechanized) at Fort Polk.

The Aviation Brigade is activating the 5th Aviation Regiment on March 8, 1988. As part of this activation, we are looking for an Honorary Colonel, Sergeant Major and Distinguished Members of former units which make up the lineage of the regiment.

Former members of any of the units mentioned in the lineage and individuals assigned to the immediate chain of command above these units are asked to contact **MAJ Antonelli or CPT Monero at (318)535-2505/6600/4026 (AV prefix 863)** or write to: **Commander, Aviation Brigade, 5th ID(M) & FP, ATTN: S-1, Fort Polk, LA 71459.**

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Air Traffic Control:

National Airspace System

by Lt. Colonel James E. Dooley, III

WASHINGTON, D.C. — The Federal Aviation Administration is rapidly progressing on its approved $15.8 billion plan to modernize the National Airspace System (NAS).

The NAS is the busiest and most complex system in the world. A mixture of equipment techniques and skills that have evolved during the past 40 years, is without doubt, the safest and most efficient. However, it is increasingly characterized by expensive maintenance, limited expansion capability, and limited adaptability to changing requirements.

The Plan

In 1982, the Reagan Administration chartered a comprehensive plan for modernizing and improving air traffic control and airway facilities services through the year 2000. The plan essentially moves the system from the vacuum tube technology to modern electronic equipment that is available today. Virtually all aspects of the ATC system will be upgraded, modernizing about 22,000 facilities which comprise the U.S. air traffic control system.

Since approximately 20 percent of the air traffic in the NAS is handled by the Department of Defense, its part in the NAS plan is equally substantial. The DOD's role is both as a major user of the air space and as a major provider of the NAS's air traffic control services.

"The NAS...is increasingly characterized by expensive maintenance, limited expansion capability, and limited adaptability to changing requirements."

As a user, we have several unique requirements which must be satisfied by the NAS plan to accommodate low level aircraft; high speed, high performance aircraft; missiles, RPVs; air defense penetration alerts and all actions coordinated with military readiness exercises. As providers to the system, the Army operates four Radar Approach Controls (ARACs) which are coupled with the Army control towers, both automated and non-automated, and the military radar units which are involved in range control functions in restricted areas at Army posts.

DOD ATC

The DOD air traffic control system has evolved over time. As missions have changed, the air traffic control system has not always changed. As bases have been relocated, as special use air space has been established or disestablished, or training locations changed, the air traffic control system has not comprehensively changed to keep pace. The NAS plan has provided an opportunity to reexamine DOD requirements in a way which has never been done before.

DOD recently undertook a major effort to examine its air traffic control system as it is today and tried to project that into the future, based on operational requirements. Not surprisingly, some problems were found within the system:

- DOD is operating approach facilities where the majority of traffic handled is civilian traffic or civilian-like traffic.
- Some missions are not military unique or military training intensive; therefore, they do not require dedicated military control.
- DOD may be operating facilities in excess of projected wartime/overseas need. As missions have changed, DOD has not changed the level of air traffic services offered.
- DOD should provide more control in or near special use airspace.
- DOD has not kept pace with technology. The technology has not been available to consolidate

(NAS — cont. on p. 82)

Lieutenant Colonel Dooley is the Army Representative to the FAA's Department of Defense National Airspace System (NAS) plan office in Washington, D.C.

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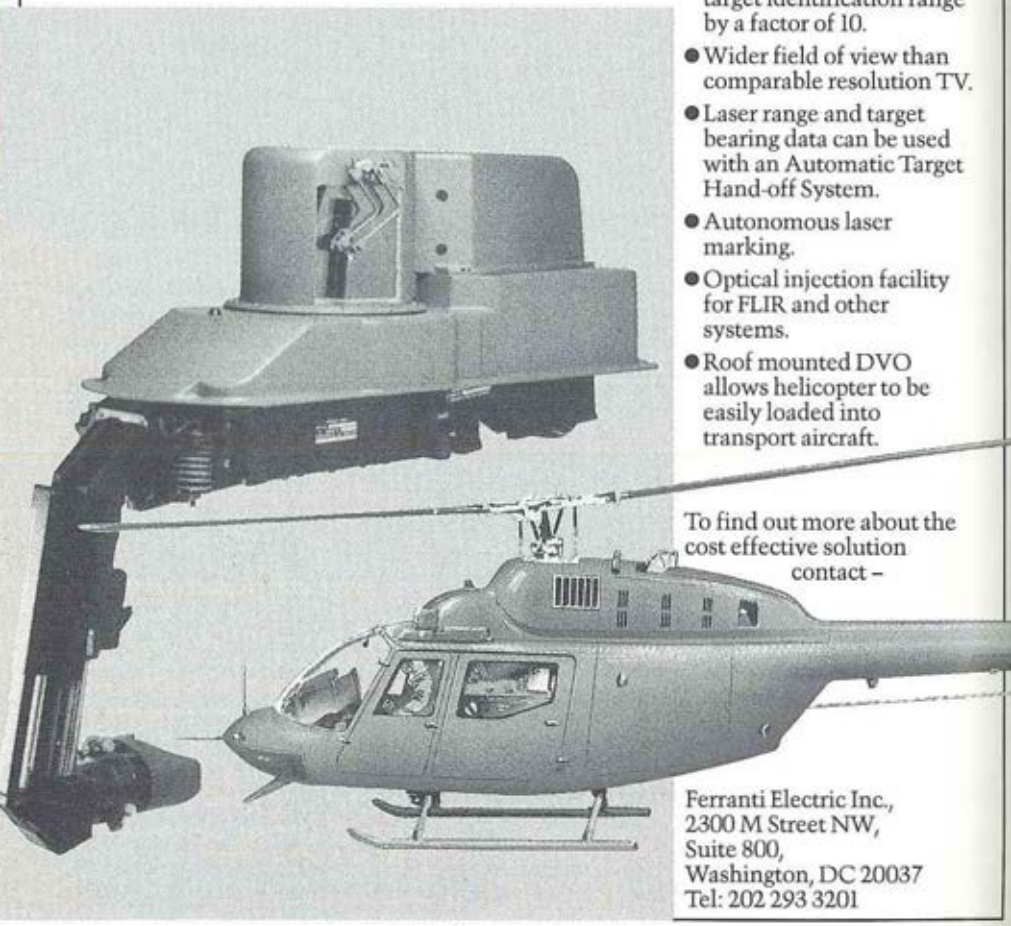

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Operations:

U.S. Army Kwajalein Atoll

by Captain Max E. Timmons, Jr.

KWAJALEIN, MARSHALL IS — When most people are asked if they have ever heard of Kwajalein, the first and characteristic response is "where the — is Kwajalein?" Those few who have studied World War II may recall that Kwajalein was an island taken by U.S. forces during the famous "Island Hopping Campaigns" in the Pacific theatre. Even the U.S. Army's knowledge of Kwajalein is vague. Only assignment officers and former Kwajalein Island personnel know of the existence of the U.S. Army Kwajalein Atoll (USAKA). A brief history of Kwajalein will familiarize the reader with Kwajalein's military past:

First Use

Kwajalein's first use as a military base was during the late 1930's when Japan began to fortify its Micronesian mandates. Prior to that period, Kwajalein Atoll (with a population of only a few hundred) was of little importance in the affairs of the Central Pacific island groups, with the foreign powers which governed them, or with those countries who had trading interests in the area (principally Spain, Germany, and Great Britain).

During World War I, Japan occupied Micronesia and in 1920 was given mandate over the island by the League of Nations.

Captain Timmons is Aviation Safety Officer, U.S. Army Kwajalein Atoll, Marshall Islands.

In 1935, Japan withdrew from the League, closed Micronesia to foreigners and began military preparations. Kwajalein Atoll's huge lagoon (the world's largest) provided an excellent fleet harbor.

USAKA has the only amphibious configured UH-1H in the U.S. Army.

WWII

The Japanese built their largest naval and supply base in the Marshall group on Kwajalein, a major air base on Roi-Namur, and a seaplane base on Ebeye. Minor installations were built on other islands in the atoll to support these bases.

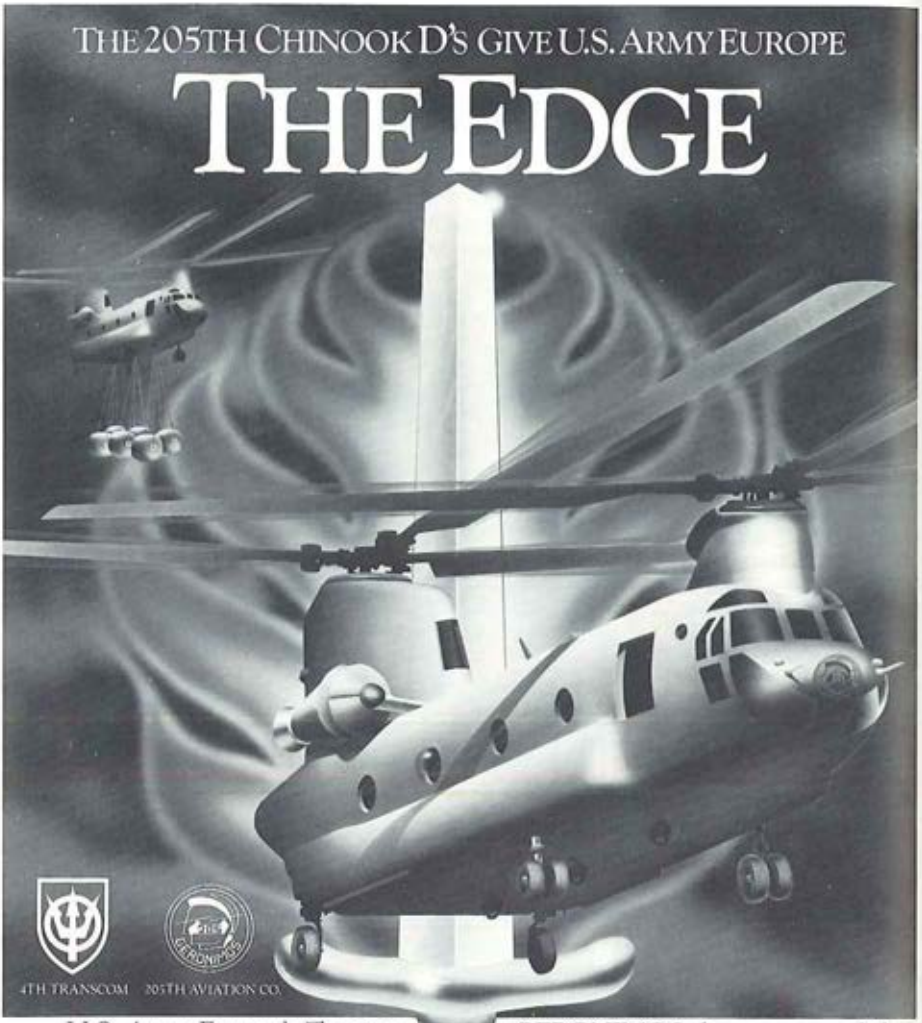
Kwajalein had a key role in the initial Japanese strike against the United States on December 7, 1941. The submarines which attacked Pearl Harbor and the task force which assaulted Wake Island departed Kwajalein's bases. By 1943, Kwajalein was the headquarters of the Japanese Fourth Fleet and a part of the Sixth (submarine) Fleet.

Kwajalein Atoll was one of the first of Japan's prewar territories to fall to American forces during World War II. After two days of air and surface bombardment (15,000 tons of ammunition rained down on the tiny land area), the atoll was invaded from the north by the U.S. Fourth Marine Division and from the south by the U.S Seventh Infantry Division on January 20, 1944. The islands were taken one by one in ground combat and the entire atoll was in American hands by February 8, 1944. American casualties numbered 372 killed and 1,582 wounded out of 41,446 troops committed. The Japanese defending forces were almost entirely eliminated; 7,870 being killed and 265 taken prisoner. On the fortified islands, virtually all Japanese installations were destroyed, and vegetation stripped from the land.

U.S. Presence

The United States has used Kwajalein for military purposes

(Atoll — cont. on p. 37)



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This is the ninth consecutive on-time delivery of the modernized CH-47D to the U.S. Army.

BOEING

Atoll – cont. from p. 35

since 1944: for one and a half years as a wartime sea and air base, seven years as a small, all-male naval outpost, seven years as a small naval community, and since 1960 as a military and civilian community devoted to missile research and testing programs.

Class II Installation

Since July 1, 1964, it has been a Class II Army Installation assigned to the NIKE-X Project Office and its successors, the SENTINEL System Command, the Safeguard System Command, the Ballistic Missile Defense Systems Command, and currently the U.S.A. Strategic Defense Command.

Kwajalein is tri-centered approximately 2100 miles southwest of Honolulu, Hawaii, 2300 miles northeast of Darwin, Australia, and 2300 miles southeast of Tokyo, Japan. Two Army airfields are located in the Atoll.

Dyess Army Airfield is located on Roi-Namur and is used exclusively by organic range aircraft. Bucholz Army Airfield on the other hand, is a major Pacific hub serving the Department of Defense as well as foreign military aircraft and two commercial carriers.

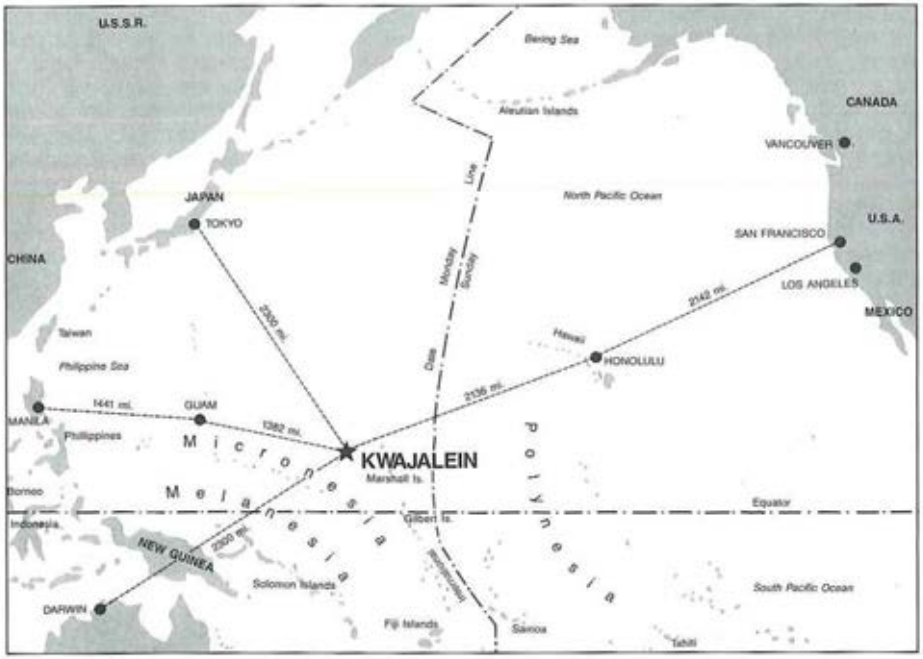
Approximately 2700 personnel and their families reside on Kwajalein. Though a majority are contractor personnel tasked to operate the range, there are currently 38 active duty Army assigned who are responsible to ensure Kwajalein's range operates smoothly.

Heart of the SDI

Kwajalein is the heart of the Strategic Defense Initiative (SDI), therefore it is an extremely high visibility mission. Kwajalein's lagoon provides the only U.S. impact site for the long range intercontinental ballistic missiles launched from California. Several of the small islands that surround the lagoon are instrumental and capable of tracking and determining accuracy of the inbound re-entry vehicles.

All logistical support at Kwajalein is currently performed by Global Associates until January 1, 1988, when Pan Am World Services, a DOD

(Atoll — cont. on p. 38)



"USAKA's two military aviators are the Army's only active duty UH-1H water landing qualified pilots. This distinction is shared by few military aviators."

Atoll – cont. from p. 37

contractor, in association with DynCorp, will assume the Logistical Support Contractor responsibility including flight operations.

Aviation Mission

The contractor's aviation mission is to provide movement of passengers, mail, and other cargo on a scheduled or special flight basis. Additional missions include aerial surveillance, photographic support, weather reconnaissance support of missile telemetry, scoring and recovery operations within 200 miles of Kwajalein Atoll, other mission support within the vicinity of Kwajalein Atoll; search (fixed wing within 200 nautical miles of Kwajalein Atoll) and occasional flights outside the vicinity of Kwajalein Atoll.

To accomplish this diversified mission two types of aircraft are utilized. Six SD3-30 Shorts (a nonstandard U.S. Army fixed wing aircraft) transport approximately 180 technicians daily to and from Roi-Namur Island. The SD3-30 replaced the aging C-7a Caribou in 1986, which had been in use on Kwajalein since 1973.

Due to the requirement to transport additional personnel to the small outer islands, acquisition of a rotary wing aircraft was warranted. In 1966, the U.S.Army began to utilize UH-1D helicopters to provide passenger and cargo service to the small instrumented islands in the atoll. These islands range in size from 5 acres to 71 acres. Though not float configured the UH-1D provided reliable over reef flight. During the 1970's five UH-1H's were acquired for Kwajalein and amphibious floats were installed to enhance flight safety.

The addition of these amphibious floats brought a new capability to the UH-1H, water landings. The float's intended use is for emergencies only, such as engine failures, etc. It is not a routine requirement to perform water landings as each instrumented island has a helipad to accomodate the UH-1H.

During search and rescue, however, the amphibious UH-1H is capable of performing a water landing, dropping rescue swimmers and recovering personnel.

Army's Role

The Army maintains two rotary wing Army Aviators in operational flying positions in order to evaluate the contractor's aviation program. These two aviators train following the contractor's ATM training program which includes water landing/taxiing on a semiannual basis. Since no tactical mission exists for Kwajalein, the ATM training consists of contact flight maneuvers and instrument flight.

Unique Capability

The amphibious configured UH-1H is found nowhere else in the U.S. Army and USAKA's two military aviators are the Army's only active duty UH-1H water landing qualified pilots. This distinction is shared by few military aviators.

In order to evaluate the contractor's aircraft maintenance operation, a senior maintenance evaluator is stationed at Kwajalein. He works in tandem with the two Army aviators to ensure the Army aviation maintenance program is carried out in accordance with appropriate Army regulations.

This year the U.S. Army Safety Center recognized Kwajalein's outstanding aviation program. The presentation of the Army Aviation Mishap Prevention Award of Excellence for three years of accident and incident free flight was made on September 4, 1987. U.S. Army Kwajalein Atoll is currently under the command of COL Richard G. Chapman, Jr. The two rated aviators are MAJ James W. Ivey, Government Flight Representative, and CPT Max E. Timmons Jr., Aviation Safety Officer. The aviation maintenance evaluator is MSG Jack D. Humphreys. IIIII

Operations:

4th of the 7th: AOE Transition

by Major Gratton O. Sealock, II

APO, SAN FRANCISCO — Garry Owen! Regards from the 4th Squadron (Air), Seventh Cavalry which is presently headquartered at Camp Garry Owen in the Republic of Korea. It is my distinct pleasure to offer this report from the field, highlighting the activities of the squadron.

Eyes and Ears

Among the most diversified combat units in the Army, the squadron continues to meet the daily challenges of maintaining a constant state of readiness while simultaneously training at individual, team, troop, and squadron levels. A truly combined arms force, the squadron presently consists of 82 combat helicopters, 36 armored and 130 wheeled vehicles. Our primary mission is to serve as the eyes and ears of the 2d Infantry Division.

The remainder of FY88 will provide additional challenges to the squadron as we redesignate, reorganize, and restation our forces. This will be accomplished while maintaining the requisite readiness posture for the 2d Infantry Division–no small task in itself.

Redesignation

On the 15th of January 1988 we stand parade, sadly casing the colors of the Seventh Cavalry and redesignating our squadron as 5th Squadron, 17th Cavalry. It is with heavy hearts that many of us bid adieu to the color and traditions of the Seventh Cavalry Regiment in Korea. However, we do so knowing that other cavalrymen will continue those fine traditions elsewhere and we will fondly regard "The Seventh First"!

Our challenge will be to continue the equally fine traditions of the Seventeenth Regiment. Cutting the cake during this ceremony on the 15th of January is definitely one of the easier tasks facing us this year. Our focus must be "Forward"!

Reorganization

The newly designated 5th Squadron, 17th Cavalry reorganizes under the Army of Excellence "L" series MTOE. This is a radical departure from our previous aviation orientation.

We will pare down from 82 aircraft to just 31! Each air troop will consist of an aeroscout platoon (6 OH-58s) and an attack platoon (4 AH-1Fs). The squadron will maintain only one UH-60 which will be maintained in the headquarters AVUM platoon. Our concerns are quite obvious to even the casual observer.

On the ground side of the house, we are nearly doubling our capabilities, as we bring up an additional ground troop. Each of these troops will employ 9 M60A3s, 6 ITVs, a ground reconnaissance platoon, a 4.2 inch mortar section, and a Fire Support Team. These additional assets will significantly increase our ground power.

The majority of the assets which we have identified as excess to the new squadron will be used to form the 230th Attack Battalion here in the division. We have been chartered to plan the activation of this unit in conjunction with our internal reorganization.

Restationing

We are presently spread between three locations — HHT and A Troop at Camp Garry Owen, B and C Troops at Camp Stanley, and D Troop at Camp Laguardia. By May 1988, the three "mini" air troops (C,D,E) will be co-located at Camp Mobile (H-220), adjacent to the 2d Infantry Division Headquarters. The two ground troops (A,B) will be located at Camp Garry Owen along with squadron headquarters.

The 230th Attack Battalion will be activated and filled at Camp Laguardia; primarily from our own assets in D Troop. The remainder of the old squadron will move to fill the new Aviation Brigade forming at Camp Stanley.

All of this activity will occur in the midst of numerous major events here in the Republic of Korea, including Team Spirit '88 and the Summer Olympic Games. It is indeed a very exciting time to be a cavalryman in Korea; we have what is aptly termed a full plate. If it is a challenge you seek, please come join us at freedom's frontier!

I wish to convey a heartfelt **(4th Sqdn — cont. on p. 79)**

Major Sealock is Executive Officer, 5th Squadron, 17th Cavalry, 2d Infantry Division, APO, San Francisco.

Research and Development:

ADOCS Guest/User Pilot Demo Program

by Major Gary D. Jerauld

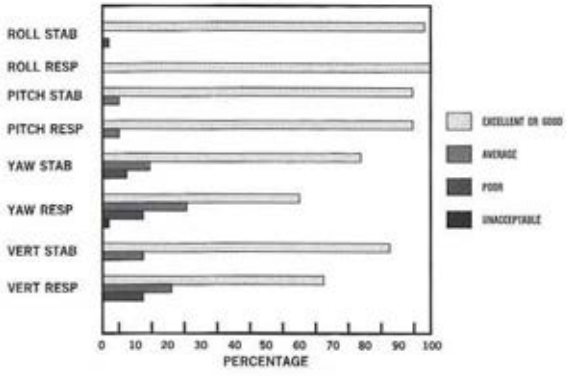
FT. EUSTIS, VA — The objective of the Advanced Digital Optical System (ADOCS) was to demonstrate the feasibility and evaluate the performance of a digital/optical flight control system for use in future Army helicopters. The Boeing Helicopter Company/Army AATD team has accomplished this objective through the ADOCS Flight Demonstration Program, which was completed in April 1987. Following this program, a Guest/User Pilot Demonstration Program was conducted during the period April 1987 through September 1987. For a basic description of the ADOCS concept, readers should consult the February 28, 1987 issue of ARMY AVIATION MAGAZINE.

MAJ Jerauld is an R&D project Officer at Aviation Applied Technology Directorate (AATD), Ft. Eustis, Va.

"Light Hawk"

The JUH-60A "Light Hawk" was flown 126 hours by 76 User/Guest pilots (military and civilian). With the exception of one week at Davison Army Airfield, Ft. Belvoir VA, all demonstration flights were conducted at Boeing Helicopter Company's flight test facility in Wilmington, DE.

Prior to flight, each pilot received an Army program briefing, ADOCS system brief, and an aircraft operations/safety briefing. The majority of the pilots flew the aircraft for two one hour flights over a time span of two days.



The first flight was structured to demonstrate the unique ADOCS features in up and away, low speed, and ground contact maneuvers. The second flight was structured to demonstrate scout/attack NOE maneuvers such as masking and unmasking, lateral jink, dash/quickstop, etc.

Baseline

Prior to the first flight, each pilot filled out a personal history questionnaire, used to gather pilot background information such as number of rotary/fixed wing hours flown, types of aircraft flown, tactical/NOE experience, as well as ergonomics factors such as height, weight, age, etc. This information was used as a data base on which pilot comments could be judged. The pilot experience ranged from W01/2LTs fresh from flight school all the way to senior industry test pilots with 10,000 plus flight hours!

Following the last flight, pilots completed a second questionnaire dealing with the meat of the subject, i.e. what did the pilot think of the system? The pilot was asked to compare the ADOCS Automatic Flight Control system (AFCS) and Primary Flight Control System (PFCS) with the standard UH-60A control system as well as make general comments with respect to quality of ride, adaptability of the side arm controllers, etc. In all cases, if a pilot was not familiar with a standard system or maneuver to compare against, he was given the opportunity to respond to the question with "cannot judge". All questionnaire responses were "digitized" by Boeing Helicopter Company per-

(ADOCS — cont. on p. 78)

Training:

Manual Writing: One Year = 4 Months

by Major Robert W. Plummer

FORT MONROE, VA — In March 1987, the U.S. Army Training Board was asked to produce a prototype manual for the future hierarchy of doctrine being developed by the Deputy Chief of Staff for Doctrine, TRADOC. The goal was not to publish it for distribution, but to roll it into an effort being conducted by the Command and General Staff College to determine how to synthesize doctrine with tactical techniques and procedures (TTP). It would have the following characteristics:

- battle sequenced
- single source
- aligned with appropriate field manuals
- contain practical and successful tactical techniques and procedures
- aimed at the tactical level of war (task force and below)
- easy to read/understand
- be in the language of the war fighter

Mission Impossible

Two action officers were assigned the mission. What we thought would be a year long effort turned out to be a 4 month suspense. This was practicable because the writers had access to a computer and word processing software, and learned how to use it to their advantage to organize, write, and edit the manual.

Major Plummer is Team Chief at U.S. Army Training Board, Ft. Monroe, VA.

The Value of Automation

The purpose of this article is to address how we used automation to complete the manual and to show the value of automation for the doctrine writer. The article will also discuss the procedures we used to develop the manual and some of the lessons learned in producing the final prototype which resulted in 179 pages of text plus 139 illustrations to be inserted into the text.

The intent is not to propose any specific system of automation over another.

"We initially had to overcome the common phobia of learning how to use the computer and the mindset that "real men don't key."

First, let me provide some background information about the writers' automation experience prior to starting this project. About two months before the manual was started, computers were set up in our office. Our automation experience was limited to identifying it as a computer. Had we been tested on how to turn it on we would have received a "no go" at that station. In other words, we had zero experience.

The USATB obviously didn't give us these machines without establishing a training program. Initially, we attended a word processing (Multimate) class which lasted about three days. In addition, the USATB contracted for more advanced computer classes for its action officers but these are not germane to this article.

Transition Time

After receiving word processing training, and a week or so of working with the computer, the action officers assigned to write the manual were comfortable with using it. The transitional time from legal pad and pencil to computer did not mean that other projects within the Board stopped. In fact, every action officer, regardless of project, transitioned to automation with little time lost from normal duties. In fact, as we gained proficiency with automation, our productivity increased immeasurably.

Writers of manuals need a tool that gives them the capability to organize their thoughts, write, edit, and print a document without having to rewrite or retype everything every time there is a change. Word processing meets this need.

To organize the manual, the action officers identified and

(Manual — cont. on p. 42)

Manual – cont. from p. 41

documented all of the TTP for the task force, team and platoon levels. A hundred and ninety TTP were identified. These were located in doctrine, special texts, tactical SOPs, Center For Army Lessons Learned Bulletins, unit developed maneuver pamphlets, magazines, forum nets, and briefings. Next, the TTP had to be analyzed to ensure that it was practical and successful, and doctrinally sound. Once this was determined, each resulting TTP was listed in the computer.

Goals

One of our goals in organizing the manual was to integrate the TTP into a battle construct. We did not want to "boiler plate" the organization of the manual into neat academic compartments such as offense, defense, etc. This is because battles aren't fought this way. Rather, a task force, for example, may simultaneously have one team delaying, one counterattacking, and one defending. As such, each TTP was individually taken from the overall listing and filed into one of the following battle sequenced categories:

- Prepare for the Battle
- Get to the Battle
- Fight the Battle
- Prepare for the Next Battle
- How to Train

These five categories evolved into chapter titles for the manual. Finally, the listing of TTP under each chapter heading was organized so that it would have the flow of a generic battle scenario. We used the computer to speed up the process of moving TTP from one list to another and then arranging them into the proper sequence.

Once all of the information was organized, the writing of the manual became a matter of transcribing and transitioning the information in and among sections. We did not want the manual to be "Clauzwitzian." Instead, we wrote in language that "green tabbers" speak and understand.

"We did not want to 'boiler plate' the organization of the manual into neat academic compartments such as offense, defense, etc... battles aren't fought this way."

Drafts

As all writers know, it is impossible to use all of the words the boss would have used in exactly the same manner and style. This is one reason why we have first drafts, second drafts, third drafts... This manual was no exception to the rule.

For the writer working on a legal pad this can be a tedious and painful experience, especially if there is a time crunch. For us, the pain of revisions was kept to a minimum, even with the short suspense, because of our word processing capability.

Word processing proved to be a creative tool for working with words and ideas. It freed us from the legal pad and paper that writers often have to use. It also freed us from the chore of retyping or rewriting whole sections or chapters. Changes, such as moving paragraphs around and inserting or deleting text were made with a few keystrokes.

Although we were proficient at using word processing to produce the manual, we initially had to overcome the common phobia of learning how to use the computer as well as the mindset that "real men don't key." The phobia vanished after we received instruction on the basics of how to use the computer, discovered that it was useful to our type of work, and developed a greater interest in learning more and more functions. Anyone who says that real men don't key has probably never written a paper more than three pages long and needed anyone to edit it. Keying a computer doesn't make you a slave to the system and does not require a great expenditure of time to learn.

Hard Lessons

Even with our experience in using automation, we discovered there were still some lessons to be learned the hard way. They usually resulted in retyping significant amounts of information. These lessons learned are listed below:

- Since this project involved the work of two action officers, we quickly learned that there had to be a master file to copy all of the revisions on. When the action officer finished writing, he had to immediately copy his information onto the master file.
- Only the master file was printed to ensure that the most

"There are many systems that can be purchased off the shelf for people who only need a system that will help them organize, write and edit. We need to make a decision now and put the tools in the hands of the people who need them."

current information was distributed. This involved only a few seconds every evening and ensured that information to be revised didn't get back in the hands of the boss without being corrected.

Key Commandments

- Under no circumstances should one type on the virtual drive. If the computer is turned off, all of the work typed on that drive becomes history. Information cannot be saved on the virtual drive.
- Don't wait for the thunder storm occurring outside to knock out the electricity before wishing you had saved your work. We suggest that if it is lightning outside, save your work every 15 minutes. For us, simply hitting the "shift F10" keys saved hours of redundant work later.
- When copying from the "A" drive onto the "C" drive, ensure that the length of the document doesn't exceed sixty pages (Multimate). If sixty pages is exceeded, the document becomes grid-locked. This means that you will only be able to retrieve about 60 pages and will have to retype everything that exceeded the 60th page. To resolve this, we divided our chapters into separate documents containing about 55 pages of text.

The manual contained practical, successful TTP. As such, much of the subject matter was transcribed directly from another source. A scanner proved to be a useful tool to copy pages from another source onto a disk. Once copied, we revised the information as necessary and inserted it into our master file.

Slow Motion

Let's now look at the tools our doctrine writers (subject matter experts) are using to produce doctrine. The tools of automation for many of our SMEs are the legal pad and pencil. That is unless they bought a computer from their personal funds and are using it for work.

For most SMEs, however, a typical scenario for producing doctrine is to go through the tedious process of hand writing a draft document. When finished, the process continues with taking the handwritten text to the only secretary down the hall who has a computer or word processor. When the secretary finally gets to it after all of the other first priorities, it is typed and returned to the SME. The draft then goes through the process of being reviewed and revised.

Changes to the document more often than not require a complete rewrite by the SME. It then goes back to the secretary for typing and the process repeats itself throughout the editing process. Every time there is an editing change, the SME pulls out the legal pad and pencil. This is experienced by most subject matter experts on a daily basis.

Modernization

From a doctrine writer's perspective it appears that everything in the Army is being modernized except the pencil and legal pad on his desk, resulting in his using the tools that writers used several hundred years ago. This is a problem that needs fixing.

There are many systems that can be purchased off the shelf for people who only need a system that will help them organize, write, and edit. They don't need state-of-the-art technology and it shouldn't take years to decide what to buy. We need to make a decision now and put the tools in the hands of the people who need them. IIIII

Test and Evaluation:

OTEA Update

by Lt. Colonel (P) Stuart W. Gerald

FALLS CHURCH, VA — Busy has been the buzz word for OTEA's Aviation Systems Evaluation Division during the past year. While the conduct and evaluation of Army Aerial Scout Follow-on Operational Test, Phase I (AAST Phase I) was our principal area of interest, and will in fact be the major thrust of this article, other systems, e.g. LHX, Air-to-Air Stinger (ATAS), and V22, to name a few, continue to receive close scrutiny under our continuous comprehensive evaluation (C2E) mission.

Change of Guard

With MAJ Paul Dvorsky's departure for C&GS in July, MAJ Ralph (Buddy) Buie became the LHX independent operational evaluator. Paul's departure was a heavy loss as he had been most instrumental in the development of the LHX OT&E requirements and had been a key participant in definition and refinement of the test and evaluation (T&E) portion of the acquisition strategy. Buddy brings with him a wealth of testing experience from the developmental testing community and should prove equally capable to the task. With the approaching LHX Defense Acquisition Board (DAB) Ia, MAJ Buie is working closely with the PMO in finalizing our operational test and evaluation (OT&E) concept. Our intent is to assist in minimizing risks and maximize "user" participation as early as possible. With no other personnel changes of significance, let's take a look at AAST Phase I.

LTC(P) Gerald is Chief, Aviation Division, U.S. Army Operational Test and Evaluation Agency.

AAST Phase I

Following last year's budgetary decision to suspend OH-58D production beyond FY87, Congress, given the known deficiencies of the OH-58C as a scout for the AH-64A , asked for the Army's proposal to fill the scouting void until the LHX is fielded.

"The baseline OH-58D is the most effective scout aircraft in the air cavalry role..."

To answer this question we were tasked to conduct an operational test to ascertain "...in the scout/reconnaissance role, what is the capability of the available candidates (OH-58C, FLIR and SAS equipped OH-58C, AH-1S(MC), AH-64A) to perform Army aeroscout functions as compared to the baseline OH-58D?"

In response the AAST Phase I was conducted with the aid of the US Army Combat Developments Experimentation Center (CDEC) at Ft. Hunter Liggett, CA from March 11 until May 13, 1987, as a force-on-force test (Blue air against Red ground) employing a Blue scout team, one scout and one attack aircraft, in the air cavalry reconnaissance role against a Red motorized rifle regiment in a hasty defense.

Real time casualty assessment was used to determine probability of kill for the aircraft and to shape the battle. The scout's ability to detect, recognize and locate targets, to survive, to navigate, to report, and to hand-over targets to the attack aircraft in hostile environment was assessed.

Following the reconnaissance trials two weeks were devoted to a Tactical Obscuration sub-test to determine system capability to detect, recognize, and locate targets in an obscured environment. Our evaluation of the AAST Phase I results concluded that the baseline OH-58D is the most effective scout aircraft in the air cavalry role followed by the AH-64A, OH-58C, OH-58C+, and the AH-1S.

In October 1987, these conclusions were briefed to the Army Select Committee considering the future of the OH-58D program. Once again the major obstacle for the OH-58D appears to lie in the budgetary arena.

MAJ Roger Rinehart continues as the Army's independent operational evaluator for V22 and Air-to-Air Stinger (ATAS). While budgetary issues continue to impact the Army's involvement in V22, our preliminary review indicates that the Army will conduct no "unique" testing during full scale development (FSD), and instead will rely upon data

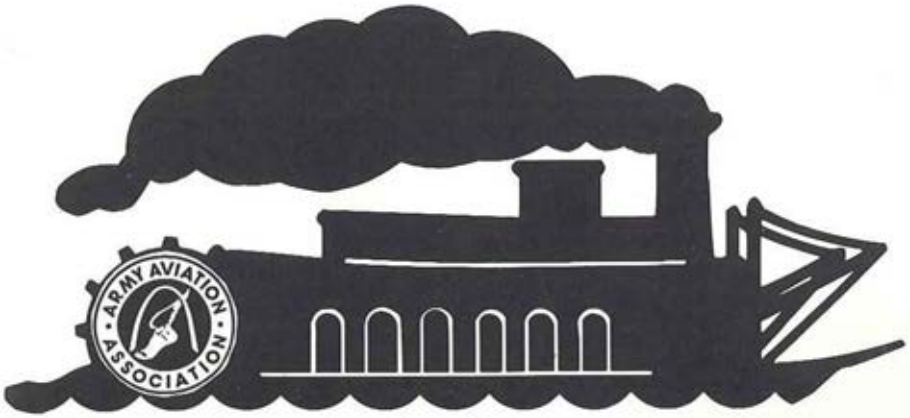
(OTEA — cont. on p. 86)

Aviation Readiness — The Spirit of '88

St. Louis

April 13-17, 1988

AAAA NATIONAL CONVENTION



1988 AAAA National Convention
April 13-17, 1988 ● St. Louis, MO
General Information

REGISTRATION:

An Advance Registration/Official Housing Form must be completed by each individual who wishes to register or attend social functions. This form may be reproduced locally if additional copies are required.

All persons attending the Professional Sessions, except spouses, must register and pay the appropriate Registration Fee; admission to all Professional Sessions will be by Registration Badge. For those attendees who are non-members and wish to attend the Professional Sessions, there is an additional $15.00 fee which includes a full-year AAAA membership. AAAA members, non-members, guests, and their spouses who only wish to attend the exhibits or social functions need not pay the Registration or Membership fees.

Advance Registrations may be submitted to the AAAA National Office at any time prior to **Monday, March 7, 1988,** together with full payment for the functions the individual wishes to attend. If time permits, Advance Registrations received after **March 7** will be processed; otherwise, they will be held for OnSite Registration. Full refunds of function fees will be made if notification is received at the AAAA National Office by phone or mail on or before **Friday, April 1.**

For those members who advance register and pre-pay their Registration and Function fees, the AAAA will provide an attractive "take-home" convention souvenir.

Individuals may pick up their registration badges and function tickets at the AAAA Registration Center in the **Cervantes Convention Center.** Operational hours of the AAAA Registration Center are listed in the **"SCHEDULE OF EVENTS".**

HOUSING:

The AAAA National Office has reserved room blocks at five St. Louis hotels and will handle all reservations for accommodations at AAAA Convention Rates. To reserve your hotel accommodations, complete and return the Advance Registration/Housing Form by **Monday, March 7.** Room requests received after **March 7** will be honored on a space-available basis.

Registration for the Professional Sessions or exhibits or attendance at a minimum of one of the convention functions listed on the form is required to reserve hotel accommodations at AAAA convention rates.

For suites, please contact **Lynn Coakley** at (203) 226-8184. Because the number of suites is limited, first priority shall be given to exhibiting Industry Member firms on a **first-come, first-served** basis.

PLEASE NOTE: Limited space is available at the five St. Louis hotels listed on the Official Housing Form. Indicate your hotel choices in order of preference: (1)—1st Choice to (5)—Last Choice. **Your Housing Request cannot be processed unless your preferences are clearly indicated on the Housing Form.**

AIR FARE SAVINGS:

TWA has been selected as the official carrier for the AAAA National Convention and will offer significantly reduced fares for travel to the Convention. Certain restrictions apply. For reservations or more information, call the AAAA's official travel agent, **Westport Travel** at **(800) 243-3335** TOLL FREE (in Connecticut, (800) 433-7183). The savings apply to reservations for TWA flights between Sunday , April 10, and Wednesday, April 20. Please consider using **TWA** and **Westport Travel** to make your travel arrangements for the AAAA National Convention.

RENT-A-CAR SAVINGS:

Through the AAAA contract with Hertz — CPD-ID #83438, AAAA card-holding members attending the AAAA Convention may obtain the Hertz U.S. Government Discount on reservations made personally, or through travel agencies or corporate travel departments. The Hertz toll-free number is **(800) 654-3131.**

BUS SHUTTLE:

Shuttle bus service will be provided between the Cervantes Convention Center and the five St. Louis hotels listed on the Official Housing Form. A complete Shuttle Bus Schedule will be provided approximately two weeks prior to the Convention.

PROFESSIONAL SESSIONS:

The Professional Sessions taking place on Thursday, April 14, through Saturday, April 16, at the Cervantes Convention Center, will be of special interest to all AAAA members, and are being arranged by **Major General Ellis D. Parker,** Commanding General of the U.S. Army Aviation Center and School, Ft. Rucker, Ala., who serves as 1988 Presentations Committee Chairman. The Host and Events Chairman of the 1988 AAAA National Convention is **Major General Richard E. Stephenson,** Commanding General, U.S. Army Aviation Systems Command, St. Louis, Mo. The Professional Sessions — all under the theme of **"Aviation Readiness... The Spirit of '88"** — will officially commence at 8:25 a.m. on **April 14,** with the Keynote Address scheduled for 8:40 a.m. Admission will be by Registration Badge.

EXHIBIT HALL DISPLAYS:

The Exhibit Hall Displays have become one of the most important segments of the AAAA National Convention — complementing the Professional Sessions with exhibits of Army Aviation products and services and opportunities to exchange vital information first-hand with the representatives of defense-related manufacturers.The Exhibit Hall Displays will be held in the Cervantes Convention Center. Refreshments will be provided on a cash basis during all open hours. The hours of operation appear in the **"SCHEDULE OF EVENTS".**

AAAA CHAPTER RECEPTIONS:

The Thursday, Friday, and Saturday evening AAAA Chapter Receptions are a MOST IMPORTANT AND UNIQUE PART of every AAAA National Convention. Chapters do their utmost nightly to top one another in providing their own brand of hospitality, entertainment, food, and beverages — for all AAAA Convention attendees. The 1988 Chapter Receptions will be held at the Sheraton St. Louis Hotel. Bus transportation will be provided from each of the "AAAA" hotels listed on the Housing Form.

MISSISSIPPI RIVER BOAT CRUISE:

As a special feature of our St. Louis AAAA National Convention, the AAAA is sponsoring a Mississippi River Boat Cruise on **Wednesday, April 13.** The cruise will be conducted at 1:00 p.m. Refreshments will be available on a cash basis. Bus transportation will depart from and return to the Cervantes Convention Center. Admission to the bus will be by appropriate badge and ticket. The famed **St. Louis Arch** is within walking distance. Feel free to visit the Arch on your own after the cruise.

1988 Official AAAA National Convention Housing Form

Please **print** or **type** all information. I understand that to receive a room at AAAA convention rates, I must register for the professional sessions or exhibits or attend at least one of the functions of the AAAA National Convention AND that this form must be received at the AAAA National Office by **Monday, March 7.** Room requests received after **March 7** will be honored on a space-available basis only. The hotels listed below will **not** accept direct reservations for rooms or suites at AAAA convention rates. All rates are subject to applicable local taxes. Cancellation or change of hotel reservations must be directed to AAAA by phone or mail through **Friday, April 1.** After **April 1,** contact your hotel directly. Failure to notify the hotel of a change in arrival may result in full cancellation.

__ __ __ __ __ __ __ THIS BOX FOR OFFICE USE ONLY

❶ Arrival Date _____ Arrival Time _____ No. Nights _____ Departure Date _____

❷ **Print** or **type** the names of persons sharing your room:

1. _____ 2. _____ 3. _____

❸ Select the hotels of your choice in order of preference. **Print** or **type** the number of your choice in the boxes provided: 1 - 1st Choice to 5 - Last Choice. If a room at the hotel of your choice is not available, a room will be reserved at your next choice. **If your choices are not clearly indicated, your request cannot be processed.** The hotels are listed in alphabetical order:

☐ **Adams's Mark Hotel**
Military Single, $55 or Double, $65
Civilian Single, $88 or Double, $98

☐ **Embassy Suites Hotel**
Military Single or Double, $55
Civilian Single, $88 or Double, $98

☐ **Marriott Pavillion Hotel**
Military Single or Double, $55
Civilian Single or Double, $75

☐ **Radisson St. Louis Hotel**
Military Single or Double, $48
Civilian Single or Double, $70

☐ **Sheraton St. Louis Hotel**
Military Single, $48 or Double, $54
Civilian Single, $74 or Double, $84

FOR OFFICE USE ONLY

❹ Select the applicable Room Rate: ☐ Military Rate ☐ Civilian Rate

Please Note: The Military Room Rate applies only to Active Army and DAC personnel and to those Reserve Component and Retired persons who are not in the current employ of defense contractors or suppliers on a full-time, part-time, or consulting basis. Military identification may be requested by the hotel to receive a military rate.

❺ Select the Room type desired: ☐ Single Occupancy ☐ Double Occupancy ☐ Special Room Request _____

1988 AAAA National Convention

ADVANCE REGISTRATION FORM—OFFICIAL HOUSING FORM

Cervantes Convention Center, St. Louis, Missouri — April 13-17, 1988

I plan to attend the 1988 AAAA NATIONAL CONVENTION. The Advance Registration Deadline is **MONDAY, MARCH 7, 1988.** If time permits, Advance Registrations received after **March 7** will be processed; otherwise, they will be held for Onsite Registration. I understand that I may receive a full refund of my function fees by phone call made to the AAAA on or before **FRIDAY, APRIL 1, 1988**, or by written notification to AAAA that is received not later than **FRIDAY, APRIL 1.** Please **print** or **type** all information. **NOTE:** Military fees and room rates apply only to Active Army and DAC personnel and to those Reserve Component and retired AAAA members who are not in the current employ of defense contractors or suppliers on a full-time, part-time, or consulting basis. **Please make checks payable to AAAA.**

KEY: THIS BOX FOR OFFICE USE ONLY ___ ___ ___ ___ ___ ___ ___ ___

FULL NAME INCLUDING RANK ______________________________

MAILING ADDRESS ______________________________

CITY ______________________ STATE ______________ ZIP ______________

ARE YOU A U.S. CITIZEN? ☐ YES; ☐ NO; If NO, YOUR NATIONALITY ______________ OFF. TELE. (   ) ______________

NICKNAME FOR BADGE ______________________ SPOUSE'S NAME, IF ATTENDING ______________

UNIT/FIRM NAME FOR BADGE ______________________________

UNIT OR FIRM CITY AND STATE FOR BADGE ______________________________

IS YOUR FIRM OR UNIT EXHIBITING? ☐ YES; ☐ NO

FOR OFFICE USE ONLY

ARE YOU A CHAPTER DELEGATE? ☐ YES; ☐ NO; IF SO, WHAT CHAPTER ______________________________

REGISTRATION FORM

NOTE—The AAAA Professional Program begins at 8:25 a.m. April 14, 1988.

SPECIFIC FUNCTION HELD AT THE 1988 NATIONAL CONVENTION OF AAAA	MIL/DAC MEMB. OR SPOUSE	CIVILIAN MEMB. OR SPOUSE	ITEM LINE TOTAL	OFFICE USE

❶ REGISTRATION FOR PROFESSIONAL SESSIONS & EXHIBITS	☐ $15	☐ $55	$_____	_____
❷ MEMBERSHIP FEE FOR NON-AAAA MEMBERS	☐ $15	☐ $15	$_____	_____
❸ MISSISSIPPI RIVER BOAT CRUISE, Wed., April 13	☐ at $8 ea	☐ at $8 ea	$_____	1 _____
❹ EARLY BIRDS CASH-BAR RECEPTION AT OLD POST OFFICE, Wed., April 13	☐ at $3 ea	☐ at $3 ea	$_____	2 _____
SPOUSES TOUR & LUNCHEON—LAWYER'S CLUB/ST. LOUIS CENTRE, Thurs., April 14	☐ at $16 ea	☐ at $16 ea	$_____	3 _____
AAAA MEMBERSHIP LUNCHEON, Thurs., April 14	☐ at $10 ea	☐ at $17 ea	$_____	4 _____
SPOUSES BREAKFAST AT UNION STATION & SHOPPING, Fri., April 15	☐ at $15 ea	☐ at $15 ea	$_____	5 _____
AAAA AWARDS LUNCHEON, Fri., April 15	☐ at $10 ea	☐ at $17 ea	$_____	6 _____
PRESIDENT'S RECEPTION, Fri., April 15	☐ at $9 ea	☐ at $18 ea	$_____	7 _____
SPOUSES TOUR & LUNCHEON—ST. CHARLES WINE GARDEN, Sat., April 16	☐ at $19 ea	☐ at $19 ea	$_____	9 _____
ST. LOUIS-STYLE BUFFET LUNCHEON, Sat., April 16	☐ at $8 ea	☐ at $15 ea	$_____	10 _____
❺ AWARDS RECEPTION & BANQUET, Sat., April 16	☐ at $25 ea	☐ at $55 ea	$_____	11 _____
AVIATION BRUNCH & CHAMPAGNE GET-AWAY, Sun., April 17	☐ at $10 ea	☐ at $16 ea	$_____	12 _____

❻ CIRCLE METHOD OF PAYMENT: MasterCard VISA Personal Check Business Check TOTAL $_____ _____

CREDIT CARD NUMBER _____ EXPIRATION DATE _____

CARDHOLDER NAME AND SIGNATURE _____

❶ Spouses are not required to register for Professional Sessions. ❷ AAAA Membership is required to attend the Professional Sessions. ❸ Limited space available on first come, first served basis. ❹ Fee covers round-trip transportation and entrance. ❺ Reserved Seating. Formal/Black Tie; Military Blues/Mess Jacket. ❻ MasterCard & VISA credit cards only; no others accepted for function fees.

This form, with the appropriate fees, must be completed and received by: AAAA, 49 Richmondville Avenue, Westport, CT 06880-2000 — on or before MONDAY, MARCH 7, 1988. Phone: (203) 226-8184.

6 ☐ Please guarantee my reservation with the following credit card:

☐ MasterCard ☐ Visa ☐ American Express ☐ Other _____

Credit Card No. _____ Expiration Date _____

☐ Please guarantee my reservation with the enclosed check made payable to AAAA in the amount of one night's lodging.

☐ I do not wish to guarantee my reservation and understand that my reservation will be held until 6 p.m. on the day of arrival, then released for sale to the general public (4 p.m. at the Sheraton St. Louis).

This form must be completed and received at AAAA, 49 Richmondville Avenue, Westport, CT 06880-2000, with applicable fees, on or before Monday, March 7. For questions, call the AAAA National Office: (203) 226-8184.

Map of the 1988 AAAA National Convention Site

1988 AAAA National Convention
April 13-17, 1988 ● St. Louis, MO
General Information

EARLY BIRDS RECEPTION AT THE OLD POST OFFICE:

On Wednesday evening, **April 13**, the AAAA will sponsor an informal cash bar reception for "early arrivals" at **THE OLD POST OFFICE**, an 1884 landmark, exquisite in detail, monumental in scale, with a special, romantic atmosphere unmatched in St. Louis. The three-story atrium features a variety of eateries. Bus transportation will depart from the Main Entrance of the Cervantes Convention Center starting at 6:45.

SPOUSES PROGRAMS:

The AAAA invites spouses to participate in a program of planned activities in the "Gateway to the West" from Thursday, April 14, through Saturday, April 16.

On **THURSDAY**, spouses are invited to hear Michele McCormick, Contributing Editor of the *ARMY TIMES*, at 10:30 a.m. Then, it's on to the well-known Lawyer's Club for a catered luncheon. After lunch, it's off to the nearby St. Louis Centre. Anchored by two major department stores, *Famous-Barr* and *Dillards*, the Centre boasts 1.5 million square feet of shopping and dining space, making it the largest enclosed downtown shopping mall in the United States. Bus transportation will depart from the Main Entrance of the Cervantes Convention Center at 12:00 noon and return you to your hotel by 4:00 p.m.

On **FRIDAY**, the traditional AAAA Spouses Breakfast will be held at the famed *American Rotisserie* at the Omni Hotel. Bus transportation will depart at 8:30 a.m. from the Main Entrance of the Cervantes Convention Center. After breakfast, there will be time for shopping and browsing at the St. Louis Union Station, a beautiful Romanesque-style train terminal, now a National Historic Landmark, restored as a festive marketplace. The new Union Station is a great place to shop for St. Louis gifts, hear the German bands that play at the Biergarten outside on the shore, or watch one of the many skits performed daily on the inside stage. The buses will return to the Cervantes Convention Center in time for the Reception and Awards Luncheon.

FRIDAY afternoon will be free for individual exploration. Information on St. Louis points of interest will be available at the AAAA Registration Center.

On **SATURDAY**, the program is designed to highlight the flavor of Old St. Louis with a guided bus tour of the St. Charles Historic District — the first Capitol of Missouri. Then, it's on to the St. Charles Vintage House Restaurant and Wine Garden for a catered luncheon and wine tasting. Following lunch, there will be time for perusing the quaint shops that are filled with antiques and 18th century arts and crafts. Bus transportation will depart from the Main Entrance of the Cervantes Convention Center at 10:00 a.m. and return you to your hotel by 4:30 p.m.

AAAA MEMBERSHIP LUNCHEON:

The AAAA Membership Luncheon will be held on Thursday, **April 14**, at the Cervantes Convention Center during which the AAAA will honor its "Outstanding Chapter Activities" and its top recruiters. All seats at this luncheon are unreserved.

AAAA EXHIBITORS RECEPTION:

The AAAA Exhibit Hall Displays will officially open with a cash bar reception from 4:30 p.m. to 7:30 p.m. on Thursday, **April 14**. Admission will be by badge.

AAAA AWARDS LUNCHEON:

The AAAA Awards Luncheon will be held at the Cervantes Convention Center on Friday, **April 15**, and will be preceded by a reception. Senior Army representatives will present the AAAA's national individual awards. All seats at this luncheon are unreserved.

THE PRESIDENT'S RECEPTION:

On Friday evening, **April 15**, the President's Reception will take place at the Sheraton St. Louis Hotel. Bus transportation will be provided from each of the "AAAA" hotels. The AAAA National President, **Major General Story C. Stevens, Ret.**, and **Mrs. Stevens**; the AAAA Executive Vice President, **Arthur H. Kesten** and **Mrs. Kesten**; the Commanding General of the USAAVNC, **Major General Ellis D. Parker** and **Mrs. Parker**; and the Commanding General of AVSCOM, **Major General Richard E. Stephenson** and **Mrs. Stephenson**, are expected to form the Receiving Line.

ST. LOUIS-STYLE BUFFET LUNCHEON:

It's only fitting to feature an informal "St. Louis" Luncheon on the closing day of the Convention, Saturday, **April 16**. The luncheon will be held at the Cervantes Convention Center. Seating at this luncheon is unreserved. Dessert will be served in the AAAA Exhibit Hall along with refreshments. Music and Chapter Photos are planned later in the afternoon.

AAAA AWARDS RECEPTION AND BANQUET:

The AAAA's Awards Reception and Banquet will be held on Saturday, **April 16**, at the Cervantes Convention Center. Senior Army representatives will present the AAAA's national unit awards.

Seating at this formal Banquet is reserved. Please note any special seating requests on the Advance Registration Form. Every attempt will be made to comply with your request. Your table number will appear on your Banquet ticket. We ask that you sit at the table where you have been assigned in consideration of the other attendees.

In accordance with DOD provisions, military and government dignitaries and AAAA senior military members and their wives are invited as AAAA Banquet guests by the AAAA National Office in accordance with the invitation policies established by the AAAA National Executive Board. Invitations are non-transferable.

These guests include (1) all Active Army O-5 Members and above, (2) all Active Army GS-15 Members and above, (3) all Active Army E-9 Members, and (4) Active Army O-4 Members, Active Army CW4 Members, and Active Army E-8 Members from the Regional area in which the National Convention is held. Invited guests are seated in random fashion at tables purchased by Industry Member firms to foster approved and meaningful interchange between government and industry.

Banquet guest acceptances must be received by Monday, **March 7**. If you are eligible to be a Banquet guest and have not received an invitation by February 1, please contact the AAAA National Office.

GET-AWAY CHAMPAGNE AND AVIATION BRUNCH:

On Sunday morning, **April 17**, the AAAA invites AAAA Convention attendees to join the AAAA President in a champagne toast in the Presidential Suite at the Sheraton St. Louis Hotel. The Aviation Brunch, which is held simultaneously, offers AAAA attendees an opportunity to make their good-byes.

1988 AAAA National Convention Schedule of Events

TUESDAY, APRIL 12, 1988

1200-1700 Registration & Ticket Sales

WEDNESDAY, APRIL 13, 1988

0800-2100 Registration & Ticket Sales
0830-1200 AAAA Scholarship Board Meeting
1200-1330 AAAA National Board Luncheon
1330-1730 AAAA National Board Meeting
1900-2100 Early Birds Reception

THURSDAY, APRIL 14, 1988

0700-1930 Registration & Ticket Sales
0700-0815 Chapter Presidents & Secretaries Breakfast
0715-0815 Speakers & Panelists Breakfast

Opening Professional Session

0825-0830 Welcome by AAAA President
0830-0840 Welcome by AVSCOM CG
0840-0910 Keynote Address — CG, III Corps & Ft. Hood
0910-0930 Aviation Branch Chief's Update
0930-0940 "Army Aviation..Near Term Focus"
0940-1000 Plans, Training, Mobilization & Security
1000-1020 Training & Doctrine
1020-1040 Combat Developments
1040-1100 Air Traffic Control
1030-1600 Spouses Program & Tour
1100-1130 General Membership Meeting
1100-1600 TAPA Career Guidance
1130-1200 AAAA Membership Reception
1200-1400 AAAA Membership Luncheon

Afternoon Professional Session

1400-1430 Aviation NCO Development
1430-1510 Aviation Proponency Plan
1510-1520 Refreshment Break
1520-1540 USAF Joint Service Initiatives
1540-1600 USN/USMC Joint Service Initiatives
1600-1630 Panel Discussion/Q&A
1630-1930 AAAA Exhibit Hall Reception
2100-0100 AAAA Chapter Receptions

FRIDAY, APRIL 15, 1988

0700-1730 Registration & Ticket Sales
0700-0800 Speakers & Panelists Breakfast

Morning Professional Session

0800-0820 TSM-LHX
0820-0840 TSM-V-22
0840-0900 TSM-Scout
0900-0920 TSM-APACHE
0920-0940 Refreshments in Exhibit Hall
0940-1000 USA Aviation Test Board
1000-1020 USAAVNDTA
1020-1040 USA OTEA
1040-1115 Aviation Safety
0830-1100 Spouses Breakfast/Tour
0900-1200 Exhibit Hall Displays Open
1100-1700 TAPA Career Guidance
1115-1200 Awards Luncheon Reception
1200-1400 AAAA Awards Luncheon
1400-1730 Exhibit Hall Displays Open
1400-1500 Refreshments in Exhibit Hall

Afternoon Professional Session

1500-1540 "How to Fight" Series — CG, 101st Airborne Division
1540-1600 USAALS Update
1600-1620 Panel Discussion/Q&A
1620-1730 AAAA Chapter Presidents' Session
1900-2030 AAAA President's Reception
2130-0100 AAAA Chapter Receptions

SATURDAY, APRIL 16, 1988

0700-1630 Registration & Ticket Sales
0700-0815 First Light Breakfast (By Invitation)

Morning Professional Session

0815-1000 NCO Program
0815-0835 AVSCOM Organization & Structure
0835-0855 PEO Structure
0855-0910 Combat Aviation PEO
0910-0925 Combat Support Aviation PEO
0925-0940 LHX PEO Session
0940-1000 Future AVSCOM Initiatives
1000-1630 Exhibit Hall Displays Open
1000-1100 Exhibit Hall Social
1000-1630 Spouses Program & Tour
1000-1630 TAPA Career Guidance

Late Morning Professional Session

1100-1130 NCO Program — Cont.
1100-1115 Aviation Testing (USA AEFA)
1115-1130 Fielding Support
1130-1215 Seminars: AH-64, UH-1, SOF, SEMA, OH-6/OH-58, CH-54, LHX
1215-1300 Seminars: AH-1, UH-60, V-22, Fixed Wing, CH-47, AHIP, ALSE/ASE
1300-1400 St. Louis-Style Luncheon
1400-1630 Exhibit Hall Social/Chapter Photos
1830-1930 AAAA Awards Banquet Reception
1930-2200 AAAA Awards Banquet
2200-0130 AAAA Chapter Receptions

SUNDAY, APRIL 17, 1988

0830-0930 AAAA National Board Meeting
0930-1030 Champagne Get-Away
0930-1200 The "Aviation Brunch"

TWA and Westport Travel Team Up for AAAA

TWA has been selected as the designated carrier for the AAAA National Convention.

The reduced fares to and from St. Louis will be 40% off Coach Class or 5% off the lowest Super Saver. These apply to advance purchase requirements of the applicable fare.

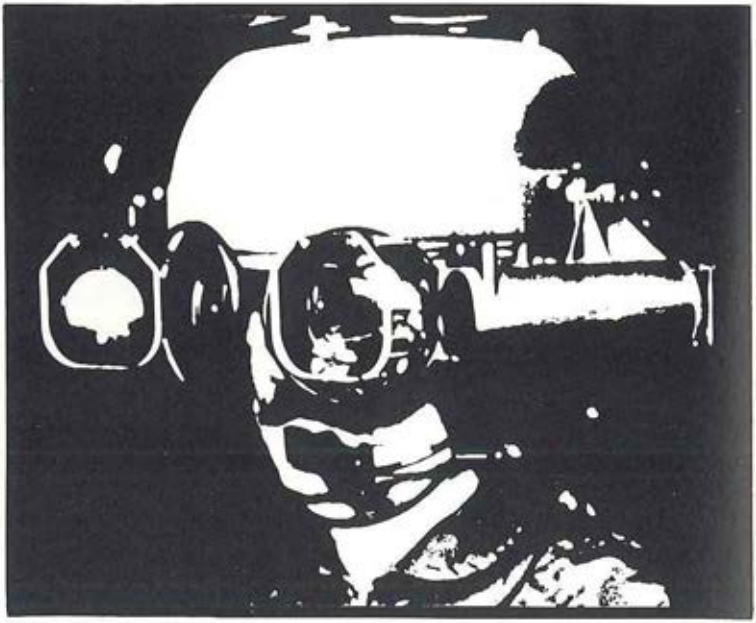
To make your convention reservations ($100,000 free insurance, convention mileage, seat assignments, boarding passes), call Westport Travel, our official agency. The Group Department toll free number is available to all convention attendees.

Call 1-800-243-3335
(In Connecticut, call 1-800-433-7183)

The savings apply to reservations on TWA flights between Sunday, April 10 and Wednesday, April 20, 1988.

Support AAAA's designated carrier and official agency

SIMULATION & TRAINING



A Special Report on Simulation & Aviation Training Devices

The Army Aviation Flight Simulator Family

by Hubert C. Pate

There is a Chinese proverb which says, "If you tell me, I forget, if you show me, I remember, and if you let me do, I understand." This is the philosophy of present Army Aviation training. In order to fight effectively as a member of the combined arms team, Army Aviation must provide realism in its training programs.

Training aviators in the actual aircraft has many advantages, but as technology advances, training in the aircraft for some tasks is becoming impractical. Safety considerations will not allow training of some tasks in the aircraft; i.e., loss of tail rotor, engine fires, cyclic hardovers, and other emergency procedures.

High cost of aircraft operation and limited funding restrict the actual aircraft flying time. Lack of adequate range facilities, lack of eyesafe lasers and ammunition cost make it impossible to provide adequate gunnery training in the aircraft at the present time.

Efficiency

How does Army Aviation continue to provide realistic training? Flight simulators are providing a means of realistic training at a fraction of the aircraft training costs. State-of-the-art technology now is capable of producing flight simulators which replicate every feature of the aircraft in minute detail which enables aviators to receive training to standards required for aviation mission accomplishment.

A UH-1 Flight Simulator

The pioneer and workhorse of the flight simulator family is the UH-1 Synthetic Flight Training System (SFTS). The system was first fielded at the United States Army Aviation Center, Ft. Rucker, AL, in FY71 and a total of 22 devices are now located strategically throughout the Army. Each device consists of four cockpits operated through a central instructor console, enabling four crews to train on a single device.

Developed and utilized as an instrument trainer, the SFTS has been the basic foundation of the Army Aviation instrument rating program, both at the institution and in the field. Twenty-eight of the 41 critical training tasks can be trained effectively in the device.

At the institution, the Initial Entry Rotary

Wing Aviator Course receives 39 hours, the Rotary Wing Refresher Training Course receives 12 hours, and the Instrument Flight Examiner Course receives 28 hours in the SFTS. In addition, each ATM aviator assigned to Ft. Rucker receives 20 hours in the device. Based on student load, overall aircraft operation costs versus flight simulator operation costs, this results in a cost avoidance of approximately $52 million annually.

In the field, UH-1 aviators and other aviators with primary aircraft for which there is no flight simulator available receive continuation and instrument training in the SFTS. Based on aviator density and ATM requirements, this results in a cost avoidance of approximately $41.8 million annually.

As the UH-1 is replaced by force modernization aircraft in the active Army and transferred to the Reserve Components, SFTS requirements will shift accordingly. A study is presently underway to determine the feasibility of splitting the four cockpits into two cockpit units and determining a redistribution plan to meet Reserve Component needs. If this study is approved, the SFTS is in for a new look.

The CH-47 Flight Simulator

Number two in the Army Aviation simulator family and number one in the visual simulator category was the CH-47. This device was first fielded at USAAVNC in FY77 and now six are fielded throughout the Army. This device replicates the CH-47 aircraft and is utilized as a flight and mission trainer, both at the institution and in the field. It provides effective training for 93 of 106 critical training tasks for the CH-47.

At the institution each CH-47 qualification student receives 18 hours training in the FS. This results in a cost avoidance of approximately $3.2 million annually based on student load, aircraft operating costs versus FS operating costs.

In the field, CH-47 aviators receive 20 hours FS time time if a FS is available. This results in a cost avoidance of approximately $24 million annually. The CH-47C aircraft is being replaced by the CH-47D. Two production model CH-47D FS have been fielded and the remaining four are scheduled for upgrade to the CH-47D configuration.

AH-1 FWS

Number three in the family was the AH-1 Flight and Weapons Simulator (FWS). This device consists of two components, a pilot station and a gunner's station which may be operated independently for individual training or linked for crew training. Its purpose is for flight and weapons systems training. It trains 61 of the 73 critical training tasks.

The first device was fielded at USAAVNC in FY79. To date, six devices have been fielded and three are scheduled for future fielding. The first generation AH-1 FWS produced visuals based on a camera model board of the terrain. The second generation AH-1FWS incorporated a laser image generator (LIG).

The third and present generation consists of visuals produced by digital imagery generation (DIG). At the institution, each AH-1 qualification student receives three hours in the FWS. This results in a cost avoidance of approximately $10.8 million annually.

In the field, the device is used for individual and crew training. Field cost avoidance is approximately $215 million.

UH-60 FS

The fourth member of the FS family was the UH-60. The first production model was fielded at USAAVNC in FY87 and two additional FS have been fielded to date. This device has been commonly misunderstood

due to the fact that the Utility Tactical Transport Aircraft System (UTTAS) FS which was fielded at USAAVNC in FY82 was not a UH-60 UTTAS FS and did not exactly replicate the aircraft.

The production model FS will be used for qualification training at the institution and continuation training in the field. It trains 76 of the 76 critical training tasks.

At the institution, each aircraft qualification student receives 10.5 hours in the device. This results in an annual cost avoidance of approximately $9.8 million. In the field, cost avoidance for continuation training will be approximately $121.5 million annually when fielding is complete.

AH-64 CMS

The latest and most sophisticated member of the family is the AH-64 Combat Mission Simulator (CMS). This device consists of two elements, a pilot station and a gunner station, allowing each to train individually or link up and train as a crew. Through computer generation interactive threat, this device provides training under realistic simulated combat conditions. It trains 166 of the 185 critical training tasks. All AH-64 combat skills training is conducted in the CMS.

At the institution, aircraft qualification students receive 15 hours in the CMS which results in approximately $13 million cost avoidance comparing CMS operation cost to aircraft operating cost and adding ammunition costs avoided. In the field, when CMS fielding is complete, continuation and combat skills training in the CMS will result in approximately $117.5 million cost avoidance.

The Future

In addition to the family of flight simulators now in the field or being fielded, there are more to come. Plans are for Flight Simulators to be fielded concurrent with new aircraft systems. In the planning stage are FS for the V-22 tilt rotor aircraft and the Light Helicopter Experimental (LHX) aircraft.

In addition, plans for networking simulators for training as a member of the combined arms team are in the developmental stage.

If we cannot appreciate the Flight Simulator for all its other favorable advantages, there is one we must accept — safety. To date, there has never been a fatality in a simulator and the worst (unverified) accident has been a broken arm. IIIII

Mr. Pate is Chief, Aviation Simulation, Material Development, Directorate of Training & Doctrine, Ft. Rucker AL.

The AH-64 Combat Mission Simulator, with pilot station and gunner station

R & D Simulation: New Capabilities in System Development

by Andrew W. Kerr

The Aeroflightdynamics Directorate of AVSCOM's Aviation Research and Technology Activity has been emphasizing a major thrust in the development and application of advanced simulation capability to meet the technology needs of Army advanced airmobile systems.

As the cost of developing and producing Army aircraft continues to escalate, it has become increasingly evident to top Army management that the potential for the use of emerging simulation technology to evaluate design approaches and system structure in depth prior to committing to hardware development must be exploited if the Army is to develop effective, affordable weapons systems.

Multifaceted Approach

In order to realize this potential, a multifacted approach is being taken to develop and apply the simulation technology required. A key factor in the ability of the Aeroflightdynamics Directorate to undertake this approach is its co-location with the NASA Ames Research Center.

Ames is the NASA lead center for the development of simulation technology. It also has the NASA lead in the equally important areas of rotorcraft technology, advanced computation, human factors, and artificial intelligence. This allows the highly integrated Army/NASA work force to address critical aviation simulation technology issues to meet Army requirements.

Manprint

Simulation activities at the Directorate include a wide variety of non-real-time platform design analysis efforts such as comprehensive rotorcraft aeromechanics analysis and advanced computational fluid dynamics, the particular simulation thrust addressed here however is the interface of the man with the system; cockpit design to meet mission requirements and real-time man-machine interactions – the essence of the MANPRINT concept. Thus activity is centered around four research facilities or capabilities: a factors/computer aided engineering workstation for cockpit design; the fixed-base full-mission Crew Station Research and Development Facility for total system crew integration evaluations; the large-motion-base Rotorcraft Systems Integration Simulator for flight management/handling qualities investigations, and in-flight simulation.

Division Established

To capitalize on emerging simulation technologies and to stimulate the flow of research products across disciplines and levels of development, the Simulation and Aircraft Systems Division was established within the Directorate in October 1987. The Division consists of four Branches and Offices.

The Army/NASA Aircrew Aircraft Integration office focuses primarily on 6.1 and 6.2 level

man-machine and non-real-time human factors and mission modeling issues. The Crew Station R&D Branch addresses 6.2 and 6.3 issues with full combat mission simulations in real time, and with some in-flight research simulations.

The Flight Controls Branch provides a mature 6.2 and 6.3 technology base in handling qualities and flight path management. Ground-based large-motion and fixed base simulation and in-flight simulation establish design criteria and requirements. They also support development and the solution of problems with fielded systems.

The Rotorcraft Systems Integration Simulator Office has the responsibility for the development of large-motion-base simulation capability and will provide the expertise and support for the integration of advanced simulation capabilities developed in conjunction with NASA into Army simulation tasks.

The Simulation and Aircraft Systems Division brings together many disciplines that have tended to be separate in the past – human factors, flight controls/handling qualities, guidance and navigation, mission equipment capabilities, aircraft survivability equipment capabilities, communication, and simulation technologies.

A³I Program

The goal of the Army/NASA Aircrew Aircraft Integration (A^3I) program is to provide a rational predictive methodology for rotorcraft cockpit design. This includes mission requirements and training system implications, that integrates human factors engineering with the other vehicle/system design disciplines at the early stages of the development process. The program will produce a prototype Human Factors/Computer Aided Engineering workstation suite for use by cockpit and system designers. This interactive capability is made possible by recent advances in computational, symbolic programming, and expert systems (AI) technology.

This capability will allow for extensive examination of tradeoffs among mission requirements, crew workload, and training requirements before committing any design to hardware. Design concepts developed in this interactive environmnet may then be further evaluated in the next levels of simulation capability prior to committing to actual hardware development.

CSRDF

The Crew Station Research and Development Facility (CSRDF) is the latest simulation tool to be made available to meet the Army's R&D simulation needs. It was developed jointly by the Army and NASA, with the Army providing requirements and funding while NASA provided technical support and oversight of the construction and integration of the facility.

The capabilities of this fixed-base full-mission air combat simulator are described in another article in this issue *(See Terry Gossett's article)*. The unique computational architecture and visual display system in this facility allow for evaluation of the aircrew's workload, performance, and effectiveness in real-time full SCAT team combat mission simulations.

RSIS

The Rotorcraft Systems Integration Simulator (RSIS) makes use of a large motion base and advanced visual systems simulation capability specifically designed to evaluate the ability of the helicopter pilot to adequately control the aircraft in nap-of-the-earth flight while performing other required mission tasks.

The simulator makes use of high fidelity math models of the flight characteristics of generic or specific rotorcraft vehicle and control systems designs to develop design criteria, evaluate design adequacy, support development, and investigate problems on fielded systems.

Recent research projects using components of the RSIS include LHX helicopter/tilt rotor simulations in support of the RAND Corporation, helicoptor air combat studies, BLACK HAWK accident investigation simulations, and simulations to develop criteria for the update of the military helicopter handling qualities specification.

In addition to ground-based simulation there is a need to evaluate the results of ground-based simulation and analysis in a

(R & D — continued on page 79)

Crew Station R&D Facility: Man-in-the-Loop War Game

by Terrence D. Gossett

The Aeroflightdynamics Directorate of the Aviation Research and Technology Activity (AVSCOM) is reemphasizing the role of Aviation simulation with a major new facility – the Crew Station Research and Development Facility (CSRDF). This facility is unique in several respects. It was built as a full combat mission simulator for the LHX, and models all of the subsystems in the LHX specifications.

All of the Blue and Red forces can interact in real-time through easily modified scenarios depicted on the Singer Link ATAC-DIG as programmed by the system integrator, CAE Electronics, LTD.

Real-Time Simulation

The Combat Mission Scenario (CMS) implemented by Flight Systems, Inc. provides for the real-time simulation of surface-to-air, air-to-surface, and air-to-air engagements involving up to 11 helicopters and 100 ground threats. The CMS models the operation of all LHX subsystems — MEP sensors, ASE receivers, countermeasures, aircraft weapons, and laser designators, as well as threat defense systems, observables, vulnerabilities, and all interactions between Blue and Red forces.

Command Systems Group, Inc. developed a composite multiple engagement scenario at the direction of PM-LHX and with the collaboration of the Aviation Center. The scenario provides for three 45 minute phases, for route reconnaissance, meeting engagement, and deliberate attack, with provisions for unscheduled changes in the mission for personnel extraction and air-to-air engagements.

A command, control, communications, and intelligence (C^3I) workstation provides for online verbal and datalink interaction with the crew and team stations, representing up to ten message senders and recipients external to the SCAT team. Extensive data recording capabilities permit assessment of the SCAT team combat mission effectiveness, with emphasis on the battle captain role.

Elements of the CSRDF

The facility consists of the following: a tandem crew station that is one crew operable, the pilot in the crew station uses a wide field of view fiber optic helmet mounted display, and interacts with a "glass cockpit" derived from the ARTI program. Systems Management Displays and Tactical Situation Displays can be activated by touch, touchpads, or through the interactive voice Input/Output system.

At each crew station are two four axis limited displacement controllers and foot pedals. Three Blue/Red team stations provide realism by each simulating either up to four SCAT aircraft, Utility aircraft, or the Hind. A C^3I station simulates the scenario by representing all communication and data links external to the eight SCAT aircraft. The Experimenter/Operator Console provides stations for the setup, control, and monitoring of the experiment.

PM-TRADE loaned the AFDD the ATAC-DIG, which provides a visual data base measuring 32 by 40 kilometers. In January 1988 the ATAC-DIG will be returned to

PM-TRADE and will be replaced with a GE Compuscene IV.

Sixteen processors make the CSRDF work — rotor computations at 120 Hertz, visual systems at 60 Hertz, forward views at team stations at 8-10 Hertz, and digital map updates at 1-3 Hertz. The host computer is a Digital VAX 8650. Modularity and flexibility in design and use were mandated in the development of the CSRDF; user-friendly editors for graphics, syntax, and other utilities were developed by CAE for the Army.

R&D Opportunities

The CSRDF permits researchers to address issues of one vs two crew operations, allocation of function between crew and team members, subsystem tradeoffs, effects of system malfunctions, level of automation needed for demanding mission tasks, and other man-machine integration issues.

Typically, following a 45 minute scenario, 160 Mbytes of data are recorded into a relational data base from which researchers can ask such questions as:

"How many times was Blue 2 exposed to, or fired on by, an SA-8?"

"How many times did the Battle Captain have a particular threat in the field of view of any particular sensor?"

"When did the Battle Captain use his Aided Target Recognizer and what was the outcome?"

"Which SCAT team member killed the most tanks/SAMS/BMPS?"

"How well did the SCAT team navigate when the GPS or Doppler failed?"

"Were more tanks killed when designated by RPVS, GLLDS, or Blue 2?"

"What was the exchange ratio for a given mission phase for the Battle Captain or for the entire SCAT team?" etc.

New Concepts for Simulation

GEN Gorman (USA Ret), was a strong advocate for simulation on the Packard Commission. He noted that the combat effectiveness (CE) of any weapon system is equal to the product of the materiel performance (MP) of the system times the proficiency of the personnel (PP) manning it, times the applicability of the doctrine (AD) of its use (CE = MP x PP x AD). In the past few years, simulation technology has progressed so that those products can be simultaneously modeled — and with men in the loop.

Now, for the first time, all the blue and red players can interact with correct representations for intervisibility, fields of view and regard, countermeasures, target acquisition, survivability and vulnerability, C^3I, and

(Crew — continued on page 75)

Simulation at Ft. Hood

by Lt. Colonel Jacob E. Starr

The time is 0500, the battlefield and cockpit are in complete darkness. Chalk 3, of the 2nd flight from Bravo Troop, 3/6 is in position, prepared to attack. The squadron's mission is to conduct a deep attack and destroy regimental, division and Army artillery elements that are positioned to disrupt the main attack to be conducted by two armor brigades of the 1st Calvary Division. The flight has successfully penetrated enemy lines, located the targets and...

"TADS is prepointed, unmask."
"Target. . . looks like massed artillery."
"Target stored"
"Strobe two o'clock."
"I need contraints."
"Missiles out!"
"He's locked on at two o'clock."
"We're at 130', get down!"
"We're Hit!"
"B24 this is B31, we're hit. . ."
"We're spining with severe vibs, engine I and primary hydraulic is out. . .we're going down!"

FREEZE—Gentlemen you just made a couple of fundamental mistakes that ended your participation in this mission and possibly this life. Now let's review the last two minutes, decide what the proper actions should be, then I'll reset the simulator and you can try it again.

The Flight Simulator Division at Ft. Hood, Texas supports a large and varied community of Army Aviators. It is the second largest training facility of its type and is designated as a FORSCOM Regional Training Center for flight simulation. As a regional center it supports active and reserve aviators, from all of the western United States. The support provided has changed over the years as new aircraft systems were fielded and as other facilities were built throughout the region to provide support dedicated to their local aviators.

Rapid Growth

The growth in flight simulator technology, like most other highly technical fields, has been rapid and Ft. Hood's physical plant has kept pace with continual expansion and upgrading. Some of us can remember when flight simulation was not so sophisticated and time spent in the devices was not a favorite pastime for most aviators.

In the early 1960s flight simulation at Ft. Hood consisted of the 1-CA-1 trainer or more commonly known as the "Blue Canoe". As limited and unpleasant as the beast was it did serve a valuable training need and more importantly the training was accomplished at a greatly reduced price. Senior leaders recognized this and pursued flight simulation as a way to ensure a well-trained, combat ready aviation force while conserving scarce defense dollars.

Fort Hood has kept pace with the growth in flight simulation technology and presently has five simulator training devices in operation which includes: the UH-1 (HUEY), CH-47 (CHINOOK), AH-1 (COBRA), and two for the AH-64 (APACHE), a Combat Mission Simulator (CMS) and Cockpit Weapons

Emergency Procedural Trainer (CWEPT). By January 1989, a sixth device, the UH-60 (BLACK HAWK) Flight Simulator, will be in place at Ft. Hood.

The most exciting story in aviation simulation is the CMS and the CWEPT. The AH-64 Combat Mission Simulator (CMS) was installed at Ft. Hood and training began on October 10, 1986. The AH-64 CMS is the world's most sophisticated flight simulator training device.

The system consists of two independent cockpits, one for the pilot and one for the co-pilot gunner. The high fidelity replication of the respective cockpits in the actual aircraft can be operated individually, or can be electronically coupled and operated as a single aircraft for integrated crew training. The system utilizes two Digital Image Generation (DIG) Systems to provide necessary visual displays through the center, left, and right windscreens.

A computer generated data base provides a tactical gaming area of approximately 1,200 square kilometers (32 x 40 km). The gaming area is a generic terrain representation that was designed to meet the diverse training requirements related to attack helicopter operations.

CWEPT

Fort Hood received the AH-64 Cockpit Weapons and Emergency Procedures Trainer (CWEPT) on November 2, 1987. The CMS and CWEPT are used to train AH-64 aviators assigned to both Fort Hood and to the rotational battalions of the APACHE Training Brigade. The CWEPT is a fixed base, non-visual, tandem seated trainer that was designed to augment training in the AH-64 CMS and the AH-64 aircraft.

Although this new equipment and sophisticaton is great, the important question is: What are we doing with the equipment to enhance our capabilities? In fact, we as trainers must keep up with the growth in simulation technology to avoid just doing the same things we did in the old blue canoe, with better and more sophisticated equipment. At Ft. Hood and throughout the Army, we are looking at our training philosophy in order to make better use of our simulators.

New Dimension

The AH-64 CMS represents a completely new dimension in flight simulation training and we have just begun to realize its full potential. This device allows for training the aviators in almost all of the required crew skills under all conditions. One of the biggest advantages of this device is the ability to interact with an enemy force that responds appropriately and realistically to the attack helicopter crews' exposure and engagement time.

Combat mission simulation allows us to identify exactly where the individual or crew is in combat proficiency and reasonably progress them through a training program. Combat mission simulators are an excellent tool for the conduct of the commander's evaluation of newly assigned aviators.

Our immediate challenge is to completely integrate our combat weapons and mission simulator resources with our other training resources (flying hours, ammunition, ranges, etc.) to produce training strategies that maximize our combat capabilities. Although the aviator training and readiness is still measured by the number of hours an individual spends in the simulator, we do a better job in developing simulator scenarios which are based on Aircrew Training Manual (ATM) and mission requirements as identified by his commander.

Sub-Trends Report

Using a computer program developed by a graduate student from the University of Texas, we are providing a report to the commander that identifies his unit's training trends. In order to accomplish this, we must evaluate performance during each training period. An example of this would be that 95 percent of his aviators are having problems executing the proper emergency procedures for a fixed pitch tail rotor but 100 percent have no problem with engine failure emergencies.

The Trends report gives visibility to this type of problem and the commander can then shift the emphasis of his instructor pilots to fixed pitch tail rotor failures. Again these tasks were used just as examples and any tasks the commander desires can be tracked.

(Ft. Hood — continued on page 75)

"Computer Generated Imagery"

Aesthetics or Threat Performance

by CW4 Bill Yarlett

Computer Generated Imagery (CGI) visual scenes have significantly enhanced the versatility of today's Army flight, weapons, and combat mission simulators. Aviators are becoming increasingly more attracted to the benefits of training in simulators, which in more and more cases, is the one and only alternative to not training some skills at all.

The main benefits realized by using simulators are tremendous operational cost savings and the availability of a safe environment in which pilots can train to maintain critical flight procedures, maintain weapon system proficiency and develop combat skills.

Trade-offs

Today's GCI visual systems can provide strikingly realistic visual scenes that pay particular attention to important scene detail. In some of the Army's sister services, visual systems have been tailored to place emphasis on high fidelity aircraft models which are rivet-for-rivet as realistic as the actual aircraft. In one instance, the detail is of such a magnitude that the pilot can see not only the escort ship's detail, but also the pilot's head which turns to watch the landing the ownship is about to perform. Even though this type of detail is impressive, only a simple two-dimensional low detail terrain model is displayed outside the airport area which does not meet the Army's needs for training in the NOE environment.

Within today's technological limitations, emphasis placed upon certain types of scene detail requires trade-offs against less important scene elements. As a result, vendors of visual systems who frequently advertise visual scene quality and performance capabilities may not voluntarily acknowledge that their system may be adversely impacted when required to provide a NOE environment which includes multiple realistic and interactive moving threats.

For instance, when an impressive "picture post card" scene is marketed and subsequently more visual demands are placed on the system to calculate threat vehicle locations and line-of-sight distances between each threat relative to the ownship, the marketed scene detail becomes very sparse.

As these add-on requirements are included, fewer of the aesthetically pleasing details can be provided. Seemingly, for every feature demanded, another is sacrificed.

Careful Management

Careful management of CGI computer capabilities is paramount in assuring the best distribution of computer assets to satisfy the training requirement. Take for example the tank driver trainer. Because the driver need not see more than a few hundred yards, the visual system can dedicate maximum performance to a small terrain area.

With this limited demand for generated terrain, CGI systems can build an extremely impressive scene with an extraordinary level of detail. Additionally, considering the relatively slow speed the tank turret articulates and the slow speeds at which the vehicle moves and turns compared to an attack helicopter, little

MILES

THE ULTIMATE IN TRAINING

MILES (Multiple Integrated Laser Engagement System) has revolutionized the way in which armies train for combat. Eye-safe laser transmitters simulate live ammunition from direct fire weapons. Detectors on opposing troops and weapon systems signal a hit or near-miss. MILES is highly valued for its ability to accurately assess battle outcomes and to teach soldiers the skills required to survive in combat and win the battle.

Fielded MILES weapons simulators range from M-16 rifles to M-1 tanks to attack helicopters and to air defense weapons. MILES is easily adapted to virtually any direct fire weapon system.

MILES has been fielded with the U.S. Army's Infantry, Armor, Air Defense and Aviation Units; U.S. Marine Corps; and with armies of many nations around the world.

Loral Electro-Optical Systems is an organization with twenty-nine years' experience in solving problems in areas of tactical training systems, information processing, space systems, and infrared counter-measures. Our capabilities span research, systems analysis, engineering development, high volume manufacturing, and total life cycle integrated logistics support for our products. MILES is an example of low cost, reliable equipment which performs a sophisticated and complex unit training task. And no one does it better...

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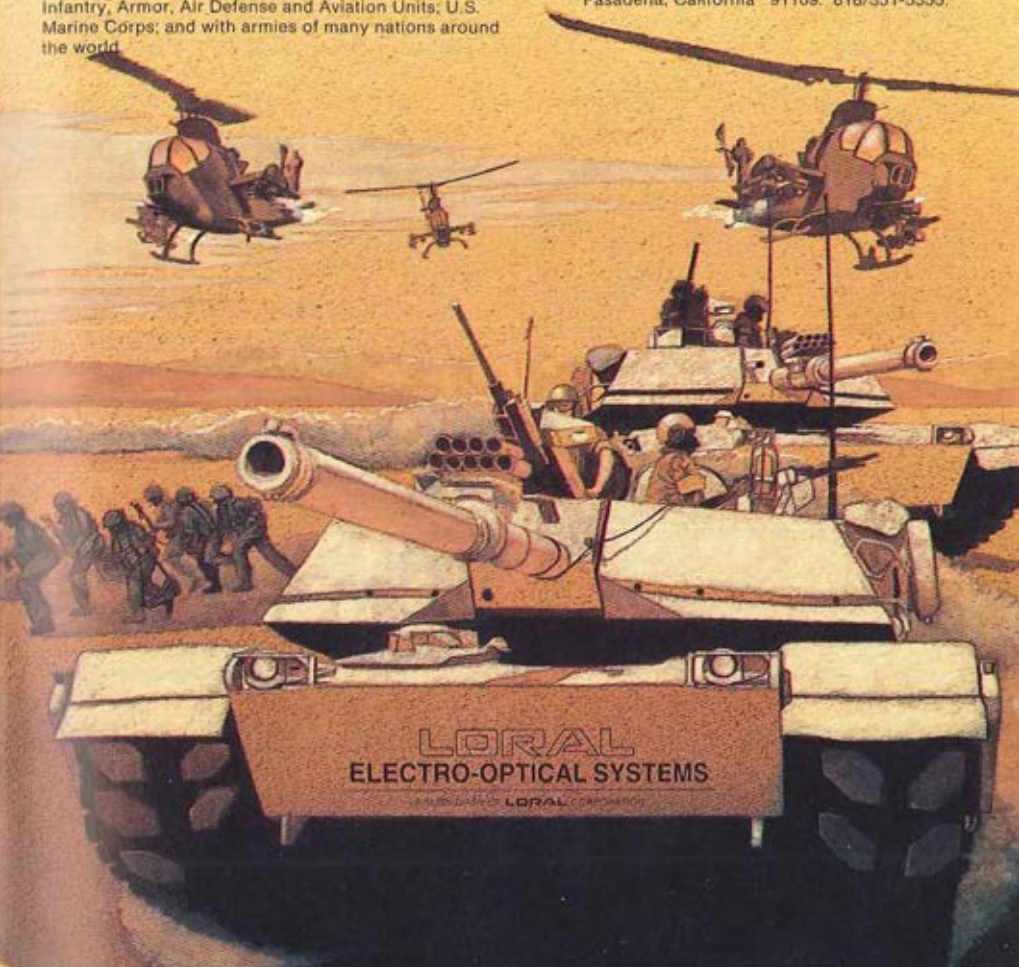


"It is highly unlikely that a visual system simulator can ever be built without some performance sacrifice. Thus, prudent decisions must be made when visual system performance is considered for any simulator program. Trade-offs in scene content will have to be made in order to get some part of all the capabilities needed."

burden is placed on the visual system to quickly retrieve data immediately beyond the field of view.

Best Utilization

Creating a helicopter simulator that makes the best utilization of the CGI system requires careful management of the computer's assets. The newest generation of aviation simulators allows the pilots to fly NOE and exercise the aircraft mission equipment package as it is found on the real aircraft.

In addition, threats are presented to the crew which allow them to train in a simulated combat environment. By carefully understanding the training requirement and managing CGI assets to best fulfill those needs, necessary trade-offs were made to maintain a high fidelity terrain model for training while maximinzing the simulator's mission equipment capability. Understanding the necessity for making these trade-offs is a key element in the world of training simulation. While the many CGI visual systems available in industry today all provide pieces of what is needed, it is doubtful any one system provides all of the desired pieces all the time.

It is highly unlikely that a visual system simulator can ever be built without some performance sacrifice. Thus, prudent decisions must be made when visual system performance is considered for any simulator program. Trade-offs in scene content will have to be made in order to get some part of all the capabilities needed.

Attention must be paid to the required number of threat vehicles and to what level of simulated fidelity they must be programmed with. Before selecting any vendor's visual system it is important to determine how the system will perform, to what level of detail, and with what shortcomings when tailored to meet program-specified performance standards.

System Impacts

Visual system performance is impacted by extended visual range requirements, levels of detail, update rates, numbers of visual channels or displays needed, field-of-view, field-of-regard, simulation of visual sensors, and slew rates of sensors and the aircraft, separately and combined.

So, when the next "gee whiz" visual system comes along, consider how it might look if it were required to fulfill the Army's requirement for a threat enhanced training device. Remember, trade-offs may have to be made which can drastically change the fidelity of the visual scene originally demonstrated. By employing smart visual system management decisions, the finished product may be less aesthetic than marketed but hopefully will be a training device that meets or exceeds threat performance requirements. IIIII

CW4 Bill Yarlett is Assistant Product Manager, Aviation Training Devices; Office of the Project Manager, Training Devices; Naval Training Center, Orlando, FL.

Aviation Simulators in the Army National Guard

by Ron Eaton

There can be little doubt regarding the positive contributions flight simulators have made to the Army National Guard (ARNG) aviation program. Over time, they have proven to be a cost effective means of supplementing actual cockpit time.

Positive contributions are not limited to cost avoidance. The training value of simulators is intangible in that untold accidents may have been prevented through effective simulator training. Both cost avoidance and accident prevention become more important as resources for aircraft and flying hours become more constrained. This is particularly true of the Army National Guard (ARNG) Aviation program.

Authorization

By 1991, the aviator authorization in the ARNG will have grown to 6,774. Based on historical retention rates and programmed undergraduate pilot training, the assigned strength will reach 95 percent in 1991. Such growth is important in that ARNG aviation units represent more than one-third of the Army's aviation force. However, creative training management will be essential if ARNG aviators are to meet and sustain required readiness standards.

The ARNG views flight simulators as an important component to current and future aviation training strategies. Some accomplishments with the UH1 Synthetic Flight Training System (SFTS) at the Eastern ARNG Aviation Training Site (AATS) located at Ft. Indiantown Gap, PA, provide examples of how important the simulators can be in those training strategies.

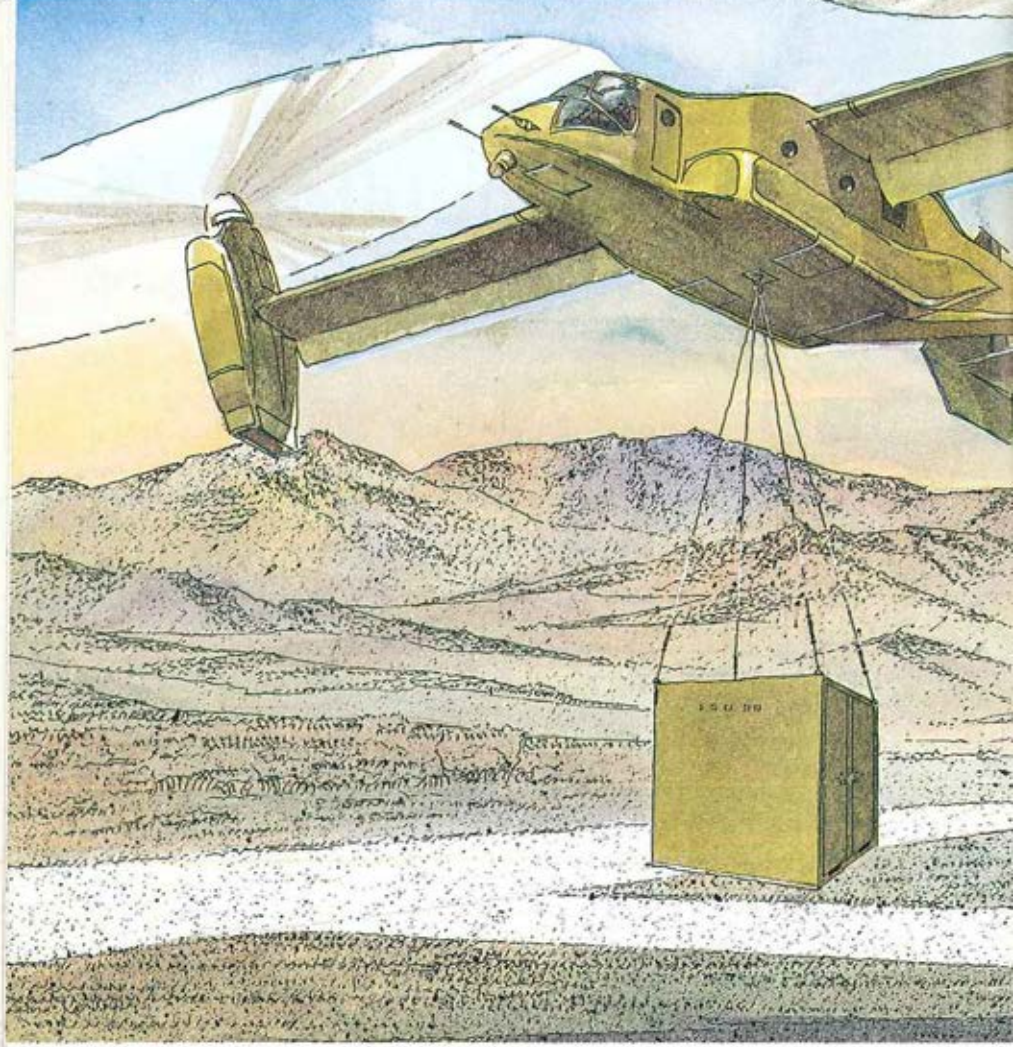
Since beginning operation of the Eastern AATS UH1-SFTS in 1977, the ARNG has supported nearly 900 active component, U.S. Army Reserve and ARNG aviators on an annual basis. A variety of training initiatives supported by the UH1-SFTS have included training of maintenance personnel in ground run-up procedures, training in emergency procedures recognition and training of aviators returning to flying status to minimize aircraft train-up time.

Course Support

The simulator has supported formal courses of instruction at the Eastern AATS such as instrument qualification, instrument requalification and an instrument flight examiner (IFE) refresher course. In 1982, the Eastern AATS initiated an IFE preparation course designed to reduce the attrition of ARNG aviators from the formal IFE qualification course conducted at Ft. Rucker. The results were significant. Prior to 1982, the attrition rate was 40 percent. Subsequently, the rate dropped to less than 4 percent.

In pure hours, the UH1-SFTS at the Eastern AATS flew 7,628 cockpit hours and accumulated 14,628 creditable aircrew training hours in FY87. Since beginning opera-

(Guard — continued on page 76)



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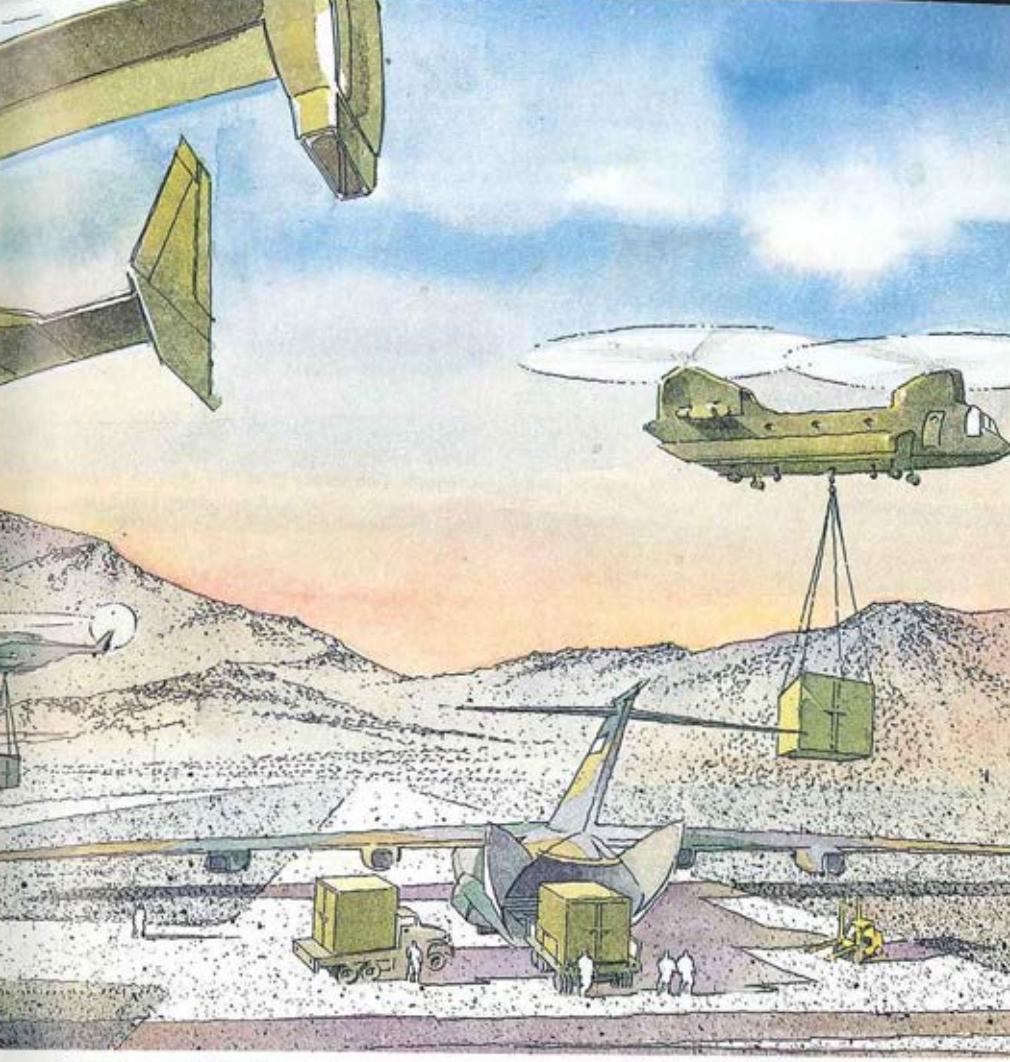
AAR Brooks & Perkins ISU containers are completely intermodal with ground transportation modes as well. And special base channels provide for forklift handling, affording easier transition from one transport means to the next.



ISU containers are designed for secure, long-term outside storage. They're completely weatherproof, and can be stacked two high when loaded, providing concentrated storage in limited space.

Designed to improve consolidation for extended maneuver warfare planning strategies, these units have proven themselves over the last two years with various military units located at Ft. Bragg, NC. Besides interfacing easily with all current equipment, they are also compatible with planned transportation modes, such as the C-17, the V-22, and new tactical trucks and ground vehicles.

Three standard ISU models provide advanced mobility and storage with long-term protection:

Model	Size	Features
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by CW4 Perry M. Smith

Force on Force Training with MILES

It is an accepted position that armies will fight as they train. Research at the National Training Center reflects that units that routinely conduct quality force-on-force combined arms team training have a 15-to-1 greater chance of attacking and defeating a unit that has a poor training program. A prerequisite for a quality tactical engagement exercise is a means of realistically simulating weapons systems. This is possible through the use of Multiple Integrated Laser Engagement System/Air-to-Ground Engagement Simulation-Air Defense (MILES/AGES-AD).

Dedicated Lasers

MILES/AGES-AD uses coded eyesafe lasers to replicate weapon range, hit zone, and kill probability against various targets. The laser transmitters rely on the actual weapon system to function properly. If the weapon system malfunctions, the transmitter will not fire. Unlike the six shooter cap guns with 100 shot rolls, the AGES-AD systems are loaded appropriately by the controllers. If the units standard load is four TOWs, that is what the controllers will load.

All players are equipped with laser detectors. The detectors are placed on the player vehicles in a manner to provide an appropriate hit profile. The detectors receive the coded laser beam and relay the data to a micro processor in the control assembly on the target. The control assembly processes the data to determine the type of weapon and if the applicable threshold level has been reached to obtain a hit. If the threshold was reached, a hierarchy decision is made as to the probability of kill given a hit by the particular weapon. Each weapon has an appropriate probability of kill for various targets. If the threshold for a hit is not reached, the MILES system is not activated at all. However, a near miss is recorded when a near miss code is received, or not enough hit codes are received. Targets hit by a MILES/AGES-AD laser will have a near miss, hit but not killed, or kill indication. When a target is killed, its weapons become inoperative. To return to battle, a controller must reset the MILES/AGES-AD.

Gunner's Perspective

From the gunner's perspective, firing the weapons with MILES/AGES-AD is transparent to firing of the actual ordnance. Applicable weapons are equipped with flash, bang, and/or smoke simulation. Unlike the actual ordnance, the gunner cannot observe rounds going down range; however, all targets (except soldiers) are equipped with an amber strobe kill indicator to provide the gunner realtime casualty assessment. A different flash sequence is provided for a near miss, hit but not killed, and killed situation. In addition, engage and kill lights, with audio, are provided to pilots during engagement.

Basic MILES to support Armor, Mechanized, and Light Infantry were fielded in 1980 with great success. Air-to-Ground Engagement Simulation and Air Defense (AGES-AD), as a follow-on to the basic MILES, allows rotary wing aviation and air defense to train as full members of the combined arms team. The program provided systems for the AH-1,

OH-58A&C, and the UH-1H helicopters as well as the Vulcan, Chaparral, and Stinger Air Defense weapons. Systems unique to the National Training Center (NTC) have also been developed to support the A-10, Hind D Surrogate (UH-1H), ZSU 23-4, and the SA-14.

Since the fielding of MILES/AGES-AD, there has been constant activity to improve the realism and provide additional capabilities. Significant efforts are ongoing to develop MILES Air-to-Air Stinger (ATAS). Initial operating capability for the MILES ATAS is scheduled for April 1991. Efforts are underway to obtain the capability of rocket and cannon livefire while simultaneously engaging a target with MILES/AGES missile. This effort will impact the AH-1 and the AH-64.

CAD-T

Boresighting the MILES/AGES TOW Telescopic Sight Unit (TSU) on the AH-1 is a tedious, time consuming task. The aircraft must be shut down and auxiliary power used to obtain an accurate boresight. To eliminate this situation, the COBRA Alignment Device-TOW (CAD-T) is being developed. The CAD-T is scheduled for fielding to the NTC in June 1988. The true effectiveness of the MILES/AGES TOW on the AH-1 is also being evaluated. When the cause(s) for the shortcomings are isolated, corrective actions will be taken.

The OH-58A&C aircraft were restricted from flight with MILES/AGES-AD in May 1986. An interim solution has been achieved and fourteen sets have been fielded to the NTC. Actions are ongoing to satisfy the Joint Readiness Training Center (JRTC) and USAREUR training requirements immediately. The final Army wide fix is anticipated by third quarter FY88.

AGES II

Development of the AGES II is underway. The AGES II will provide systems for the AH-64, OH-58D, UH-60, CH-47D, and HELLFIRE Ground Support System (HGSS). The HGSS will perform the same functions as the Ground Laser Locator Designator (GLLD). AGES II will have several improvements over the original MILES/AGES-AD. The AGES II transmitter will transmit a discreet player identification code along with standard MILES messages. Each system will also have event recording to provide post mission briefing data. The probability of a hit will be adjusted to reflect ASE employment.

An urgent need for AGES to support BLACKHAWK and APACHE training was surfaced by the user community. To satisfy this requirement 127 Interim BLACKHAWK AGES systems were fielded in 1987. Twenty Accelerated APACHE AGES II sets are to be fielded in 3rd quarter FY88.

(MILES — continued on page 76)

"Through superior training, the U.S. Army will be able to fight out numbered and consistently win, even when opposed by equipment that is technically as good as ours."

AVSCOM: Lifeline for Flight Simulation

by Captain Ward S. Silvola

Any discussion about Army flight simulation would be incomplete without talking about the U.S. Army Aviation Systems Command (AVSCOM) and its Weapon Systems Management Office (WSMO) for Synthetic Flight Trainer Systems (SFTS).

The WSMO is designated by charter by AVSCOM's Commander, and reports to the Commander through the Directorate for Readiness. Our current staff consists of the Weapon Systems Manager, one engineer, one property administrator, one logistics management specialist, one program analyst, and one secretary.

Mission

Our mission is to provide system-oriented, intensive management of all programs peculiar to SFTS. We plan, control, and correlate funding programs and schedules; establish objectives; oversee progress to maintain overall program balance and timely readiness support to field users; and assure cmmand visibility and management control of all program actions at all times. Participating with the Project Manager for Training Devices (PM TRADE) and aircraft system managers, we assure that all system requirements are fully considered and integrated for assigned SFTS. Liaison is established with appropriate commands, project and product managers, higher headquarters, and other Services, as necessary for the accomplishment of our mission.

Key Programs

We provide total management responsibility for all fielded SFTS from our office with the assistance of contracting officer's representatives (CORs) provided by the various installations and designated by the Contracting Officer.

Maintenance and support for the SFTS is accomplished through the contractor logistics support concept. Currently, two contracts are being administered with SimuFlite Division of Singer Aerospace and Marine Systems. One is competitive, for the UH-1 Flight Simulator (FS), while the second is sole source, for the remaining visual devices [AH-1 Flight Weapons Simulator (FWS), CH-47FS, UH-60FS, and AH-64 Combat Mission Simulator (CMS)].

Our readiness responsibility is that of budgeting for maintenance and contractor logistics support, obtaining requirements for

OH-58 scores direct hit with Air-to-Air Stinger.

Air-to-Air Stinger Shifts the Balance in Air-to-Air Combat

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GENERAL DYNAMICS
Valley Systems Division

flight simulator support from the field, and developing the statements of work for the two contracts.

Current Program

Ongoing flight simulation support is being provided to Army aviation, worldwide, by 36 different devices from 16 locations. The current devices include the UH-1FS, CH-47FS, UH-60FS, AH-1FWS, and AH-64CMS, while the installations range from the Republic of Korea, numerous CONUS sites, to the Federal Republic of Germany. Today's cost to provide maintenance support and replenish spares for this array of flight simulators is approximately $13.5 million. Added to this is a worldwide spare parts inventory valued at approximately $28 million.

As with most things, the arena of flight simulation is ever-changing. In FY88 alone, the number of SFTS will increase by forty percent, for a total of 51, and three new installations will begin providing support. The maintenance support and replenishment spares cost will nearly double to approximately $21 million, while the associated spare parts inventory value will increase to approximately $54 million.

Beyond FY88, continued fieldings through the last AH-64CMS in FY91 will bring the total number of devices to 62, support installations to 22, and the worldwide spare parts inventory to a projected value of $77 million.

In keeping with the dynamic and fast-paced tradition of Army aviation, AVSCOM remains in step. The performance of our critical functions within the flight simulation lifeline will continue toward the goal of keeping Army Aviation "Above the Best." IIIII

Captain Silvola is Weapon Systems Manager for Synthetic Flight Training, AVSCOM, St. Louis, MO

SFTS DEVICES BY LOCATION THROUGH FY 88

LOCATION	UH-1 2B24	CH-47D 2B31	AH-1S 2B33	UH-60A 2B38	AH-64 2B40	TOTAL
FT BELVOIR	1					1
FT BRAGG	1			1*	1*	3
FT CAMPBELL	1	1	1	2*	1*	6
FT HOOD	1	1*	1		1	4
HUNTER ARMY AIRFIELD	1					1
FT INDIANTOWN GAP	1		1*			2
FT KNOX	1					1
FT LEWIS	1	1	1	1*		4
FT ORD	1					1
FT RILEY	1					1
FT RUCKER	8	1	1/1*	1/1*	1	14
FT SILL	1					1
FT SHAFTER	1					1
HANAU	1		1	1		3
ILLESHEIM			1	1*	1*	3
MANNHEIM		1*				1
KOREA	1	1*				2
MARANA, AZ			1*			1
LOS ALAMITOS, CA	1*					1
TOTAL	23	6	9	8	5	51

*FY 88 FIELDINGS

AVSCOM - PROVIDING SOLDIERS THE DECISIVE EDGE

Ft. Hood
(continued from page 63)

The next step is to develop a reporting system that provides key feedback to Commanders on the proficiency level of each individual and crew.

Gunnery Programs

We at Ft. Hood are also working to refine the interface between our gunnery programs and our simulation programs. The interface starts with the commander's evaluation and takes the individual and crew through the live firing tables. This program must be successfully completed by each individual and crew prior to going to the range for crew qualification. Combat and weapons simulators are ideal for aerial gunnery skills tests.

Training scenarios have also been developed and refined to provide training through crew level for the unit commander's primary missions i.e., deep attack, screen, etc. Of course the more sophisticated the device, the more aggressive the training program can be.

Many improvements are still possible and new ideas are regularly being explored. One such idea now being pursued is the use of the Trends Report Program to allocate simulator training time. That is, a commander, by closely monitoring the report, can redistribute simulator time from proficient crews to those crews requiring additional or extra training. This is the first step in transitioning from an individual orientation based on a minimum time requirement to a crew oriented program based on proficiency.

The important first step in the complete integration of simulation into our mission and gunnery training is standardization. Standardization of crews (battle rostering), crew mission standardization (battle drills) and standard gunnery programs. Once this is done we can then tackle the problem of transitioning from a program based on the demonstrated proficiency of individuals and crews to accomplish mission tasks. IIIII

LTC Starr is Installation Officer, Fort Hood, TX.

Crew
(continued from page 61)

platform/weapon characterizations. Computer generated Imagery (CGI) can now provide data bases from the Defense Mapping Agency and be modified with fine detail to fit the needs of the researcher, tactician, trainer, or tester in assessing areas of interest.

Visual generation systems, display systems, and computers can now provide sufficient throughput and fidelity to characterize the performance, operations and doctrine of the red and blue forces in real time, thus providing for the human interface in the simulation. These capabilities are now available to the CSRDF.

Priorities and Plans

The first priority of any Army aviation simulation plan is to serve AVSCOM and the Aviation Center in the support of current and development of the next generation aircraft systems.

The second priority is to maintain and develop facilities that can address all configuration and subsystems simulation issues that occur during the development of any aircraft system.

The third priority is to provide simulators that are sufficiently modular, flexible, and robust to properly characterize aviation systems in full combat mission scenarios.

To date the research simulations on the CSRDF have emphasized development of performance metrics and validation of subsystem models for the LHX program. During the period from February to May 1988 the GE Compuscene IV visual system will be integrated into the CSRDF. Planned research programs include one vs two crew full mission simulations, subsystem effectiveness tradeoffs, assessment of malfunction effects, allocations of functions, and determination of the level of automation needed for various mission phases. Army Aviation leads technology in the Army and the CSRDF is a great way to stay in the lead in system/concept developments.

Mr. Gossett is Chief of Simulation and Aircraft Systems Division, Aeroflightdynamics Directorate, U.S. Army Aviation Research and Technology Activity, NASA Ames Research Center, Moffett Field, CA.

Guard (continued from page 67)

tion in 1977, over 72,350 cockpit hours have been flown. But simulation utilization has not been limited to the UH1 SFTS at the Eastern AATS. ARNG aviators have been training on UH1, AH1 and CH-47 simulators at various Army installations as well as the C-12 simulator available through Flight Safety International.

The future of simulators in the ARNG is bright. The UH1-SFTS at the Eastern AATS will continue to support innovative aviation training. ARNG aviators assigned to AH-64 attack units will utilize the Combat Mission Simulators and the Cockpit Weapons and Emergency Procedures Trainer (CWEPT). Both the Western AATS located in Marana, AZ and the Eastern AATS will begin operating an AH1 Flight Weapons Simulator (FWS) in late FY88.

Training proposals for the use of the AH1-FWS currently under review by the National Guard Bureau Army Aviation Division include greater weapons system proficiency training, aero scout aviator training and a familiarization course for ARNG ground commanders. It is the latter that may provide the greatest dividends in that ARNG ground commanders will gain a greater appreciation for the attack helicopter's ability to contribute to the combined arms effort on the battlefield.

In any regard, the ARNG views simulators as important resources in the management of aviator training. As such, innovative approaches involving simulators in the total aviation training management strategy will be the rule for the future, not the exception. IIIII

Mr. Eaton is Aviation Operations Team Leader, National Guard Bureau, Army Aviation Division, Washington, DC.

MILES (continued from page 71)

A major advancement of the AGES II program is the eyesafe Laser Rangefinder/Designator (LRF/D) capability. This capability will be applicable to the AH-64, OH-58D, and the HGSS. This will provide remote AGES HELLFIRE and Copperhead designator capability by a HGSS, OH-58D, or another AH-64.

AAR

With MILES/AGES-AD, soldiers will be able to experience the combat environment during peacetime without the associated dangers. Commanders can conduct force-on-force collective training exercises and observe how the unit as a whole would respond under the stress of combat. Furthermore, the learning should not end when the exercise concludes. Battle outcomes can be quickly and accurately assessed. As soon as practical after the engagement, all players should be brought together to conduct the After Action Review (AAR).

The AAR is a discussion of the events and actions taken by individual teams and players during exercises. This will help in capturing and disseminating lessons learned. Repetition of the exercises will develop the necessary team and individual skills to survive and win on the next battlefield. Repetition will also cement the tactical link between the combat arms to support the AirLand Battle Doctrine.

Rules of Engagement

Tactical engagement simulation must go well beyond the hardware. Commanders must ensure compliance with the rules of engagement. This includes no cheating and ensuring that all players are equipped with operational MILES/AGES-AD. A primary means of doing this is through quality controllers. It is also imperative that commanders understand the total tactical engagement training concept and apply it. The Army Training Support Center recognizes the importance of tactical engagement simulation exercises and has placed training specialists at installations throughout the Army.

The Western political situation prohibits us from obtaining a quantitative advantage. Furthermore, the current economic situation is making it more and more difficult to maintain a technical advantage. This is why training must be of foremost importance to every soldier and their commanders. There are no short cuts. Through superior training, the U.S. Army will be able to fight outnumbered and consistently win, even when opposed by equipment that is technically as good as ours. IIIII

CW4 Smith is Systems Manager, Directorate of Training and Doctrine, U.S. Army Aviation Center, Ft. Rucker, AL

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ADOCS – cont. from p. 40

sonnel and placed in bar graph format.

Results

The vast majority of the pilots commented that ADOCS provides a very high level of aircraft stability (hands off hover for 5-10 seconds), and the fact that they are flying a fly-by-light system is immediately obvious. The sidearm controllers were well received, and the pilots also agree that the ADOCS AFCS provides better aircraft response than typical Stability Augmentation systems (SAS) of today's helicopters.

After studying the accompanying graph, readers can see that roll stability and roll response proved to be the best feature of the ADOCS system. Pilots could roll the aircraft deadbeat to a predetermined attitude, release the control input, and the system would maintain that roll attitude indefinitely. Pitch stability and response were also rated very highly. Pilots with tactical experience especially appreciated the barometric/radar altitude hold, velocity stability, and hover assist selectable modes that were incorporated into the AFCS.

Improvement Needed

The aforementioned graph also points ou that yaw and vertical stability and response were areas where more improvement needs to be done. An ADOCS follow-on program is underway through March of 1988 to address the yaw/vertical problems.

Further developmental tests will be conducted with regard to AFCS control laws, a displacement sidearm collective controller will be designed, installed, and tested, and control response in autorotational flight profiles will be evaluated.

The technology has been proven which will provide advanced flight control systems for future Army aircraft, insuring success on the battlefield of tomorrow! IIIII

V Corps – cont. from p. 11

During the last 90 days of FY87, the company flew 1050 accident free hours while performing a share of the USAREUR CH-47 Company classified air missions, support for allies, and CH-47 support for exercise "DISPLAY DETERMINATION 87" in Turkey.

C Co, 7th Bn, 158th Avn Regt (Assault) trains and operates both day and night in support of Corps air assault and air support missions while conducting a special mission 2000 miles from Wiesbaden. British, French, Belgian, and German allies have benefitted immediately from interoperability training with C 7-158 Avn Regt.

Rear Operations

During 1987 the Brigade has continued to be the Corps' tactical combat force command and control headquarters for V Corps rear area operations. To accomplish this mission, TF 12, including aviation, infantry, and artillery forces have been formed under the 12th Aviation Brigade commander. TF 12's operations center has been colocated at the Corps rear TAC CP with elements from the Corps G3, G2, RAOC, and the military police. Rear operations are then coordinated by the corps staff elements and fought by the communities, military police, and finally by the Task Force itself.

Logistics – cont. from p. 24

orate is working is the Unit Maintenance Aircraft Recovery Kit (UMARK). The UMARK was conceived to meet the needs of the AVUM units to quickly rig their organic helicopters for recovery.

The UMARK will be a lightweight, man-portable kit designed to be used to rig aircraft in eight to fifteen minutes by three riggers or less. It is planned for the basic kit to be applicable to all aircraft models. The school is processing the operational and organizational (O&O) plan to define the requirements for the kit.

ARK

An off shoot of the UMARK program is the upgrading of the present AVIM Aerial Recovery Kit (ARK), using advanced technology materials designed during the development of the UMARK, to reduce kit weight by 50 percent and also adapt to the UH-60, AH-64 and OH-58. This improved AVIM ARK will contain aerial recovery gear for all Army Aircraft — fixed and rotary wing.

The key to achieving aircraft that are combat ready is having skilled maintainers with the right support equipment to accomplish that mission. The Aviation Logistics School is dedicated to the accomplishment of the "Support and Sustain" mission. These are but a few ways that we are working to provide the aviation commander these critical assets. IIIII

Devils – cont. from p. 31

Exercises (FTX). The principal purpose of these FTXs was to broaden the brigade staff expertise in working with ground task forces. While we still have much to learn about employment and support of tank and mechanized infantry task forces, we have come a very long way in true combined arms training.

JAAT

Joint Air Attack Team (JAAT) training at Fort Polk is the best seen to date. The 23rd Tactical Fighter Wing (A-10) is located at England Air Force Base some 40 miles east of Fort Polk. We have collectively established a training program with the 23rd TFW which includes JAAT weeks conducted quarterly.

During this week, both Air Force and Army pilots sit down in the classroom and talk about JAAT operations. Then these same pilots go out and fly JAAT against a target array. These JAATs have been conducted both live and dry fire.

To sustain the training conducted during JAAT weeks, the Aviation Brigade using either 5th AHB or 4-12 CAV and the 23rd TFW conduct JAAT periods throughout the quarter. These periods are two to four hours in length and the JAATs are flown in the local training area.

NTC

The Aviation Brigade has participated in three National Training Center (NTC) Rotations during the calendar year 1987. The 5th AHB was the principal command and control headquarters responsible for executing this training. The aviation task force was composed of at least two companies of attack helicopters and the headquarters and service company. During the last rotation of the year an air cavalry troop was added to improve the reconnaissance capability. This proved to be the most effective mix for rotations to the NTC.

Force Modernization

The 5th ID(M) is at the beginning of a major force modernization upgrade. Several of the new items are scheduled for the Aviation Brigade.

During this calendar year, the brigade fielded the Heavy Expanded Mobility Tactical Truck (HEMTT) which significantly enhanced the brigade's ability to support itself with fuel and ammunition. In the future, we will field the M1 tank in the cavalry squadron, the High Mobility Multipurpose Wheeled Vehicle (HMMWV), OH-58D, UH-60 and AH64.

All of these items will improve the brigade's ability to fight as a member of the combined arms team.

In conclusion, the 5th Infantry Division is an exciting and challenging place for aviation. The Aviation Brigade organization, training, and force modernization upgrade are on the fast track at Fort Polk. IIIII

R & D – cont. from p. 59

real flight environment. In order to do this effectively, specially configured research aircraft are required to allow for sufficient rapid reconfiguration and parametric variations for verification.

NASA and the Aeroflightdynamics Directorate currently operate two aircraft of this type: a variable stability CH-47B for flight control and handling qualities research, and a TH-1 PNVS surrogate for visually coupled system research and voice control input and output research.

Current plans call for return of the CH-47 for upgrade and placement in the fleet, so planning is underway for a much needed replacement aircraft capable of the flight characteristics which will be required for the next generation air-to-air combat vehicle.

Practical Use

It has become more and more evident that it is in the interest of the Army to make the maximum practical use of simulation in the early development stages of advanced combat rotorcraft. The high price associated with inadequate performance and fixing problems in flight hardware justifies investing the time and resources required to avoid costly mistakes and rework.

The exploitation of this technology comes with up-front investment which may appear high in the tech-base context, but will more than pay for itself in the long run.

Mr. Kerr is Director, Aeroflightdynamics Directorate, U.S. Army Aviation Research and Technology Activity, NASA Ames, Moffett Field, CA.

4th Sqdn – cont. from p. 39

thank you to all of the Cavalry Squadrons deployed worldwide, who took the time to respond to our inquiries concerning their AOE transition experiences. Your comments and suggestions have proven to be of tremendous value to us in this endeavor. FORWARD! IIIII

OH-58D

The scout that gives a close-up look at multimission versatility.

OH-58D: the scout that "looks" for trouble from incredible distances... for a variety of U.S. Army missions.

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LHX – cont. from p. 10

ing size, cost, and performance. These detailed designs facilitated subsystem and performance trade-offs and provided a basis of comparisons against industry provided designs.

One study team conducted helicopter and tilt rotor simulation efforts using the fixed base simulators at NASA/Ames. This was accomplished to evaluate the man-in-the-loop portion of the study. Army, NASA, and industry pilots flew ten typical maneuver tasks and seven typical target engagement tasks to develop and validate input for unit and theater level performance computer models.

Both RAND and IDA recommended the LHX be a new development conventional helicopter. This recommendation is based on operational effectiveness and lowest 20 year operational costs making it the most cost effective alternative; the advantage of being able to exploit survivability and kill potential through advances in new technology mission equipment and weapons without being totally dependent on them and the advantage of incorporating advanced rotor craft design technology at reasonable risk.

Pending final approval by the Defense Acquisition Board, January 1988, it is planned that the LHX will enter the Demonstration/Validation phase in February 1988. IIIII

CSM Traylor (continued from page 16)

CMF 93

Q: *When are we going to generate more 93P 1SG positions?*

A: Brigade Commanders should send changes to Brigade TO&E and recommend HHCs of Aviation Brigade and Battalion 1SGT positions be changed from 67Z to 93P with justification being, making the 93P competitive with the 67 for CSM.

Q: *There have been some problems with 93Ps graduating without the ability to possess a clearance, this has been mainly a problem of citizenship. Is there a fix in the works?*

A: This problem has been identified at the school and a fix for the problem is forthcoming to require some type of clearance prior to entry into the course.

Q: *The 93P needs to be more technically than tactically proficient when leaving the school. We can teach them to erect camouflage nets etc. at the unit. They need increased training in typing, filing, forms, records, etc., and communications equipment (including secure capabilities) and procedures. Can, or is anything being done?*

A: The school is currently looking at administrative skills required by 93P. Changes are being staffed to increase those skills taught in school.

Q: *What is the projected gain by combining 93H&J into 93C?*

A: Increases the commanders' flexibility for assignments and enhance promotion opportunity.

Q: *Why does the 93B become a 93P at E7?*

A: Current initiatives will change the 93B structure; proposal is to flow 93B to E8 and cap at E9. Tasks, conditions and standards are being developed for skill levels 4 and 5.

Q: *Can the output of 93B be increased to fill A/C seats? We are currently required to have two pilots for NVG and NOE.*

A: The school is scheduled to train 358 in FY88, will produce 465 in FY89 and 456 in FY90. This should help alleviate the problem in the field.

Q: *Do you have any closing remarks?*

A: Yes, as you know, we have just concluded our first Aviation NCO Symposium. I feel that the meeting was a great success and we were able to discuss many of the problems and issues affecting us and many questions were asked of the "school house" (USAAVNC). We will get the answers to the field in the immediate future. I'm hoping the Symposium will be continued in the future. I feel it will have positive impact. Also I want to remind everyone of the enlisted portion of the AAAA National Convention in St. Louis. I would like to see everyone participate.

Q *Thank you for the time you've given us. Best of luck in your endeavors as the Branch CSM. We'll see you in St. Louis at the Convention.*

SFC (P) William C. Hawkins is the Opns Chf, 1st Bn, 4th Avn Rgmt, Ft. Carson, CO. The interview was conducted for "ARMY AVIATION MAGAZINE" during the first Annual Aviation NCO Symposium at Ft. Rucker in Nov. 1987.

Branch (continued from page 6)

Commanders' Conference which was held here at Fort Rucker late last year from 30 November to 5 December. The 37 Brigade commanders in attendance unanimously stated this was the best Brigade Commanders' Conference ever held. It gave all of us an opportunity to interact with one another, on a one-to-one basis, or in formal or informal groups.

Our brigade commanders, and others, had a lot of important questions to ask, and comments and suggestions to make concerning their mission, aviation technology, tactics, personnel, and funding constraints. I can honestly say I was "kept on my toes".

As an adjunct to the dialogue, I noticed that our brigade commanders are making things happen, and I alluded to this during my opening remarks at the conference when I told the attendees that we in Army Aviation must have a near term focus on what was going on in our branch. I explained to them that though there was the "Big Picture", we had to know what was happening within our respective commands.

One Voice

Also, I mentioned the necessity that we speak with one voice. I said what was important was that we not be encumbered by divergent ideas or doctrine which would mitigate the Branch's effectiveness to communicate its needs or to make a mission statement. After talking with our brigade commanders and aviation officers, I could not help but feel that we are unanimous in our purpose—to be the very best in whatever we do in the defense of our nation.

During the conference, we were honored to have Major General Richard E. Stephenson, Commanding General, AVSCOM, address us. He told about the great strides made by AVSCOM in getting spare aviation parts to the field, and in filling requisitions in a timely manner.

Trainers of the Year

It was with great pleasure that during the conference we honored our two Army Aviation Association of America Trainers of the Year. They were Major James D. Thurman, S-3 of the APACHE Training Brigade, Fort Hood, Texas, and Staff Sergeant Bobby W. Eades, Instructor, Air Traffic Control (ATC) Division, here at the Aviation Center.

Our Brigade Commanders' Conference was outstanding because of the esprit and professionalism of all those involved, especially the men and women of the Directorate of Combined Arms Training (DCAT), ably supervised by their director, Colonel Ernest F. Estes. They were responsible for the administrative and logistical support in putting together our finest Brigade Commanders' Conference to date. IIIII

NAS (continued from page 33)

or combine facilities. DOD is operating a number of facilities closely aligned geographically, but has been unable to combined those facilities into one semi-area control facility as technology now makes possible.

DOD/FAA Interfaces

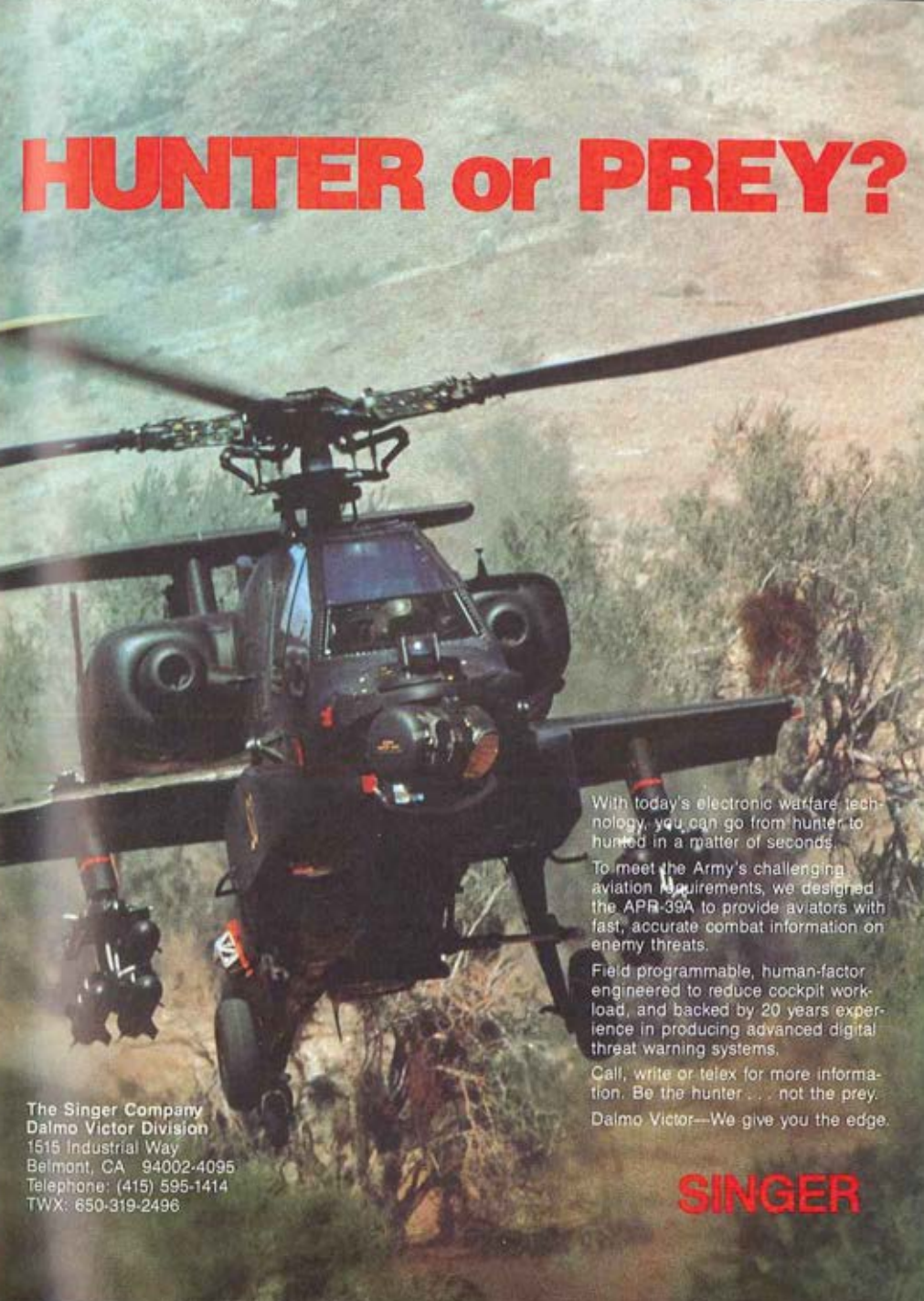
Communications-wise, DOD currently has a considerable number of interfaces with the FAA system. Varying according to location and branch of service, they include leased service B, teletype, voice; shared radar data interface; DOD ATC facility to FAA center data interface; air defense to FAA interfaces; and military ranges to FAA interface.

The Future

With a solid look toward solving the problems and combining the technological breakthroughs available to DOD, the future appears bright. The Army continues to be an active participant in the NAS plan. With membership on the DOD Advisory Committee on Federal Aviation and the arrival into the DOD's joint NAS Plan Office at the Federal Aviation Administration of your representative, the Army's voice for ATC architecture is being roundly heard. Planning for the Army's air traffic control architecture for the year 2000 is one of the basic jobs of the NAS Plan Office.

As the Army moves forward with better plans and technology, we have the opportunity to enhance safety, avoid unnecessary costs, increase the entire national airspace system reliability and improve on our own performance. The Army is ready to meet that challenge. IIIII

HUNTER or PREY?



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Gates – cont. from p. 28

diting or not crediting a month. If an aviator signs out of a non-operational flying duty position on the 14th day of the month or earlier, credit begins the following day and the month is counted. Conversely, if the date the aviator signs out is the 15th day of a month or later, the month is not counted. If departure from an operational flying duty position is on the 15th day or later, the month is counted. Departures on the 14th day or earlier causes the month not to be counted.

If an aviator remains in operational flying positions in consecutive assignments, credit is continuous. Leave and travel time between aviation assignments counts toward TOFDC. In addition, TDY enroute for periods less than 90 days for aviators between consecutive flying assignments, counts toward TOFDC.

Updating TOFDC

Aviators who have errors in their TOFDC may request an audit of their personnel file and an update of their TOFDC by writing or calling Ms Jean Arnold: Commander, Total Army Personnel Agency, ATTN: DAPC-OPZ-AV (Ms. Arnold), 200 Stovall Street, Alexandria, VA 22332-0410. AV 221-8156, Commercial (202) 325-8156.

Supporting documents that may help in the audit process include DA Form 759's, DA Form 1610's and any Academic Efficiency Reports that may be missing from the aviator's personnel file. Either Ms. Arnold or I can update TOFDC data and once we determine your TOFDC does in fact require updating we will input that data into both the personnel and finance data base and the action is completed. Pay close attention to that TOFDC and subsequently making the 1st, 2nd and that 3rd gate! IIIII

AWARDS AND HONORS

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

Aviation Off. Adv Course Class 87-4 (10/2/87): CPTs Michael J. Kerr, Dennis M. Olson, Jr., Richard H. Reichelt, Robin R. Schuh, William K. Sorrell, Jr., 1LT David R. Arterburn: Master Tactician Awards; CPT Wayne J. Childress, Communicative Arts Award.

Off. Rotary Wing Aviator Course Class 87-18 (11/6/87): 2LT Randy L. Keach, Dist. Grad; 2LTs Brian P. Shoop, Randall W. Woodworth, David H. Creech, Jr., Honor Graduates.

WO Rotary Wing Aviator Course Class 87-17 (11/6/87): WO Robert J. Kitchens, Jr., Dist. Grad; WO Paul C. Smith, Honor Graduate, Leadership Award & Cls Leader; WOs Philip F. Mawaka III, David M. Conboy, Monika G. Diaz, Honor Grad.

AWO Advanced Course Class 87-11 (11/17/87): CW2 William S. Nagle, Dist. Graduate; CW2s Dennis P. Levan, Phillip M. Crow, Robert M. Lucas, CW3 Dale N. Whitemore, Honor Graduates.

Off. Rotary Wing Aviator Course Class 87-20 (11/20/87): 2LT Brian P. Newton, Dist. Graduate; 1LT Joseph W. Tew, 2LTs Alan C. Urban, Philip A. Simmons, Mark A. Evans, Honor Graduates.

WO Rotary Wing Aviator Course Class 87-19 (11/20/87): WO Kevin C. Kreigh, Dist. Graduate; WOs Charles L. Noble, Jr., Brian L. Brown, Robert D. Falise, Jesus F. Fontes, Honor Graduates.

WO Senior Course Class 87-7 (11/24/87): CW3 Gary L. Johansen, Dist. Graduate; CW3s Raphael Thomas, Richard K. Buergel, Michael G. Halby, Jr., Honor Graduates.

Off. Rotary Wing Aviator Course Class 87-22 (12/9/87): 1LT Gregory L. Kennedy, Dist. Graduate; 2LTs Douglas L. Kinney, James D. Lehl, Honor Graduates.

WO Rotary Wing Aviator Course Class 87-21 (12/9/87): WO Michael A. Streiber, Dist. Graduate; WOs Jeffrey L. Wilderson, James W. Plzak, Brian D. Thomas, Bert W. Close, Honor Graduates.

WO Senior Course Class 88-1 (12/16/87): CW4 Darrell K. Gatchell, Dist. Graduate; CW4 Steven G. Lamb, CW3 Philip K. Campbell, Honor Grads.

Off. Rotary Wing Course Class 87-24 (12/17/87): 2LT Stephen J. Fisher, Dist. Graduate; 2LTs Max K. Beidler, Mark A. Anderson, Wade D. Koontz, Jerome C. Meyer, Honor Graduates.

WO Rotary Wing Aviator Course Class 87-23 (12/17/87): WO Darin A. Skopek, Dist. Graduate; WOs Henry R. Jasso, Richard W. Hanberg, David J. Goodall, Arie E. Gruner, Honor Grads.

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ASE – cont. from p. 18

the contractor with the most innovative and affordable approach was awarded the contract to produce these new deskside computer trainers. The ASET II, designed for both Scout Attack and SEMA, is a challenging interactive game to sharpen your knowledge and battle decision making.

Near Term

ASE availability and employment will be written into all the ARTEPs (Army Training and Evaluation Programs) by the end of the year and in two years ASE will be in all the Aircrew Training Manuals. The 35KW6 and 35RW6 ASE skill identifier training is progressing well for Scout Attack and Utility aircraft at Ft. Gordon and for SEMA at Ft. Huachuca.

ASE maintenance and repair parts stockage is being driven by the operational status of the ASE in determining the fully mission capable status of aircraft in the DA Form 1352 reporting. At this time, ASE appears to be performing well in the field. My Logistics Management Division is coordinating with the CECOM (Communications & Electronics Command) Logistics Assistance Offices worldwide to gather available ASE repair information so that we can provide you with the proper parts in a timely manner when needed.

I look forward to contributing to your improved readiness and war fighting capability and I will continue to make every effort to provide effective and high quality ASE so that when coupled with proper tactics and training you will be able to win the first battle of the next war and survive to fight the second.

Give me a call if I can be of any assistance! IIIII

OTEA – cont. from p. 44

derived from Navy/USMC/USAF developmental/operational testing (DT/OT) to assess operational effectiveness and suitability against Army requirements.

ATAS integration testing on the OH-58C has been completed and MAJ Rinehart is in the process of completing an OTEA Capstone Evaluation. This recently completed testing and our evaluation report will support an Army milestone decision for Low Rate Initial Production (LRIP). Planning to support future flight envelope expansion testing on the OH-58D and other aircraft applications, e.g. AH-1S/AH-64A is ongoing with the PM office, TRADOC System manager for missiles, and TRADOC Independent Evaluation Directorate (TIED).

This latest update will hopefully provide you information on some of the more important ongoing efforts within OTEA's aviation evaluation division. Questions you may have, should be directed to me, Mr. Larry D. Leiby, or to one of the branch chiefs at: AV Prefix 289, Commercial AC (202) 756-2464 (chief), 2486 (Analysis Branch), 2468 (Evaluation Branch). IIIII

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BRIEFINGS

Discussing future ... **MG Richard D. Kenyon, Ret** (right), discusses the future of Army Aviation with the Distinguished Graduates of flight classes awarded wings at Ft. Rucker, AL, Wednesday,

(U.S. Army Photo by SP Vicki Hudson)

Dec. 9. From the left are **WO1 Michael A. Strieber** and **1LT Gregory L. Kennedy.** A former assistant commandant at Rucker and speaker at the graduation ceremony, Kenyon presently resides in Enterprise, AL.

Submersible Systems' "Spare Air" scuba air system has saved the life of a U.S. Navy helicopter crewman who crashed during recent hostilities in the Persian Gulf. According to a Company press release, the Navy said that the crewman was pinned within his aircraft upon impact and said that he would not have survived the crash had it not been for **Spare Air** and the approximately two extra minutes it provided him to free himself. Referred to in the military as HEED (helicopter emergency egress device) II, **Spare Air** has become a standard addition to Navy and Marine Corps helicopter flight crews' gear.

BEI Defense Systems Company has announced the appointment of **Michael G. Florimbi** as President and Chief Operating Officer.

Korean War Memorial. On October 28, 1986, **President Reagan** signed Public law 99-572 authorizing erection of a memorial in the Washington, D.C. area by the American Battle Monuments Commission honoring the members of the U.S. Armed Forces who served during the Korean War. The memorial will pay tribute to more than 5.7 million Americans who served during the three year period of the Korean War from June 1950 to August 1953. The legislation authorizing this $6M project requires the memorial to be erected with private contributions except for a Federal appropriation of $1 million. Those interested, may give proper and long overdue recognition to America's Korean War veterans through a fully tax deductible contribution to this memorial. All contributions to the Korean War Memorial Fund are placed in their entirety in a special Trust Account with the U.S. Treasury and will be utilized solely for the purpose intended. Contributions should be sent to the following address: Korean War Memorial Fund/ABMC, P.O. Box 2372, Washington, D.C. 20013-2372.

U.S. Army Executive Flight Detachment will hold a reunion for all members June 10-12 at Ft. Rucker, AL. Contact Diana Floyd, Rt. 4,

AVIATION COMMAND CHANGES

The following changes were provided from TAPA (except those marked with an *:

LTC Justin G. Ballou, III, — Cdr 268th Attack Helicopter Battalion, Ft. Lewis, WA. To be assigned to the Office for Information Management, Peantagon. Effective October 1987. Name and Rank of Replacement: LTC Phillip L. Curtis.

LTC William R. Clontz, — 24th Attack Helicopter Battalion, Ft. Stewart, GA. To be assigned to Senior Service College. Effective February 1988. Name and Rank of Replacement: LTC Johnnie L. Shepherd.

LTC Robert B. Bailey — Cdr, 227th Attack Helicopter Battalion, Ft. Campbell, KY. To be assigned to Senior Service College. Effective January 1988. Name and Rank of Replacement: LTC Charles S. Hurt.

LTC Burt S. Tackaberry — Cdr, 123rd Aviation Battalion, Ft. Campbell, KY. To be assigned to Senior Service College. Effective December 1987. Name and Rank of Replacement: LTC Albert P. Brocious.

Box 304, Ozark, AL 36360. Phone: (205) 774-5970 for more information.

CW4 Robert L. Kirksey recently completed his 10,000th hour of accident-free flight. The 48 year old fixed wing pilot was greeted outside the B.C. Walsh hangar by Secretary of the Army John O. Marsh, Jr. and approximately 40 well wishers — Kirksey finds himself in the very select company of perhaps a dozen other aviators with similar records including the co-pilot on his record setting flight, **CW4 Lyle Real** who has 10,400 hours to date.

145th Combat Aviation Battalion (Vietnam) Association is seeking anyone who served with the 145th CAB and 45th Transportation Battalion in Vietnam, the units of HHC, UTT, 25th, 57th MED, 68th, 71st, 74th, 117th, 118th, 120th, 135th, 147th, 184th, 190th, 197th, 213th, 242nd, 334th, 335th AVN Companies, CO A 82nd AVN BN, CO A, 501st AVN BN, and all Detachments of these units. Please contact: 145th Combat Aviation Battalion (Vietnam) Association, James L. Bodkin, 3719 Forst Hill Ave., Fort Wayne, IN 46805, 1-219-483-5149.

Safe flying records recently netted awards for ten aviators assigned to the 6th Infantry Division (Light) and U.S. Army Garrison, AK. Command aviation safety officer **Chief Warrant Officer Marvin Reynolds** commended the aviators, saying that the Army in Alaska hasn't had a Class A accident in three years. Honored for having 1,000 hours of accident-free flying were Chief Warrant Officers **John R. Hardy** and **Paul L. Speckmaier,** both pilots from Company G, 1st Battalion, 123rd Aviation Regiment at Ft. Richardson. Honored for 750 hours were **Sgts. Edward J. Jasper** and **Dorn J. Tennis,** crew chiefs with Company G. Those honored for 500 hours were **Chief Warrant Officer Dempsey L. Birmingham,** a pilot with the Utility Airplane Detachment, plus **Chief Warrant Officer Robert K. Englund** and **1st Lt. Dana F. Simon,** both pilots with Company F, 1st Battalion, 123rd Aviation Regiment at Ft. Wainwright. Also honored for 500 safe hours were **Chief Warrant Officer Thomas W. Fox,** a pilot for Company G; **1st Lt. Bradley J. Cochran,** a pilot for Headquarters and Headquarters Company, Aviation Brigade; and **Sgt. Charles T. Davidson,** a crew chief with Company G.

Gene A. Murphy

Gene A. Murphy, a paraplegic due to Vietnam War wounds, was elected national commander of the one-million-member Disabled Veterans (DAV) by delegates to the organization's national convention August 20th. The Sioux Fall, S.D., man pledged to do battle against erosion of federal benefits and programs for the nation's 2.2 million service-connected disabled veterans and their families. **Murphy** was wounded while on patrol in the jungles of Vietnam in 1969. **Murphy** holds the Purple Heart and the Bronze Star with V device. Among his numerous honors is distinction as South Dakota's Handicapped Citizen of the Year in 1979. For several years, **Murphy** has been a star player on the Sioux Wheelers, a nationally known wheelchair basketball team. He's also an avid skier.

GE Aircraft Engines has announced that **Brian Brimelow** has been elected by the company's Board of Directors to the position of Vice President and General Manager of the newly-formed Government Products Division. **Brimelow** joined GE in 1973.

Morton Diamond

Morton Diamond has been named president and general manager of ITT Avionics Division, a unit of ITT Defense Technology Corporation headquartered in Nutey, N.J. Mr. Diamond succees Mr. Engen in the new position. Mr. Diamond has been with ITT Avionics for 30 years, serving as vice president, director of operations for the past two years. He also served as vice president, director of engineering at ITT Avionics from 1978 to 1985.

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Signature _____

'New Chapter Officers'

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

LTC Charles S. Hurt (VP Memb), Air Assault Chapter.

Cadet Brandon Duffek (VP Pub Rel), The Citadel Chapter.

CW4 Boni M. Buoni (Sr VP); LTC Thomas P. Cole (VP Memb); and SGM Jerry Pittman (VP Enl Aff); Colonial Virginia Chapter.

Donald L. Platt (VP Schol Aff) and Flight Lieutenant Laurence B. Smith (VP Int'l Aff), Lindbergh Chapter.

LTC Michael E. Thomas (VP North), Morning Calm Chapter.

MAJ John F. Finan, Jr. (VP Activ), Mount Rainier Chapter.

LTC Thomas A. Swindell (Pres), CPT James T. Pote (Sec), CW2 Joe J. Stark (Trea), CW2 Dwight A. McDonald (VP Memb), CPT Roland E. Vitulio (VP Prog), CSM Douglas B. Laird (VP Enl Aff), and CPT Michael E. Hassel (VP Commun Aff), Thunderhorse Chapter.

'Aviation Soldiers'

SP4 Christina Boshanes, Aviation Center Chapter (December).

Sustaining Members

The **Best Western Covington Inn**, represented by Harry Covington, and **Jenkins & Wynne Ford**, represented by Don

(Continued on Next Page)

AAAA Overview

52 Chapters vie for CY87 'AAAA Top Chapter Award'

BACKGROUND: The Association cites its '**Top Chapter**' annually during the course of the General Membership Luncheon held at each AAAA National Convention. This national recognition was first accorded in 1973, and has been provided since that date.

AWARD: The actual 'award' has varied over the years. The initial-year winning Chapter was given a suitable plaque while in later years a 30-inch, four-color masonite lectern seal was the 'award.' Today's '**Top Chapter**' receives a 7-foot by 7-foot, four-color AAAA felt banner valued at $300.00.

ACCEPTANCE: The President of each year's winning Chapter is invited to attend the General Membership Luncheon at the National Convention as an Ass'n head table guest, and to accept the '**Top Chapter Award**' for the previous CY from the National President.

CRITERIA: All Chapters, **regardless of size,** have been invited to compete for this annual award. Of diminishing importance in the view of the selection committee are the Chapter's CY87:

(1) meeting activity (type, frequency, etc.), to include unusual, innovative, and successful programming.

(2) membership growth.

(3) pursuit of a local AAAA Awards Program (AA, Soldier, DAC, Unit of the Year Awards; AAAA Soldier of the Month; Honorary Memberships; etc.

(4) participation in community affairs.

(5) maintenance of a full Executive Board slate.

(6) its interface with the AAAA National Office in the administration of its Chapter affairs (Meeting notices, fiscal reports, etc.)

SELECTION: The AAAA's National Awards Committee will select the '**CY87 Top Chapter**' at its Friday, February 5, meeting in Arlington, Va.

NOTIFICATION: The winning Chapter is to be notified of its selection by the AAAA National Office during the week of February 7-13.

Have you registered for the AAAA convention?

Details are in the center of this magazine

Dec. 1987-Apr. 1988 Calendar of AAAA Chapter Activities

December, 1987

■ Dec. 16. Mainz Chapter. Late afternoon general membership meeting. Refreshments and snacks. Village Inn Officers' NCOs' Club.

■ Dec. 17. Checkpoint Charlie Chapter. Christmas Party and Dinner. The Checkpoint Club.

■ Dec. 18. Corpus Christi Chapter. Annual Balloting for Chapter Office. Building 8 Lobby. Late afternoon Christmas Party. BOQ Ward Room.

■ Dec. 18. Thunderhorse Chapter. After dinner general membership meeting. Fulda Community Club Officers' Bar.

January, 1988

■ Jan. 12. Washington, D.C. Chapter. Professional dinner meeting. COL Harry W. Blot, USMC, Program Manager, V-22, Naval Air Systems Command, guest speaker. Ft. McNair Officers' Club.

■ Jan. 17-22. Chesapeake Bay Chapter. Six-Day Ski Trip to Stowe. Lift ticket, 5 nights'lodging, four dinners, five breakfasts, transportation, $239.

■ Jan. 21. Colonial Virginia Chapter. Mid-afternoon general membership meeting. Chapter elections, 1988 Programming Review. Ft. Eustis Officers' Club.

■ Jan. 22. Lindbergh Chapter. Professional dinner meeting. MG Story C. Stevens, Ret., AAAA Nat'l President, guest speaker. Lawyers' Club, Downtown St. Louis.

■ Jan. 23. AAAA National Executive Board. Quarterly business meeting. Sheraton St. Louis Hotel.

■ Jan. 28. Corpus Christi Chapter. Late afternoon professional-social meeting. Videotape presentation: '1987 Paris Air Show.' Officers' Club.

■ Jan. 29. Leavenworth Chapter. Early afternoon professional meeting. MG Ronald K. Andreson, guest speaker. Topic: 'LHX'. Bell Hall, Building 111.

February, 1988

■ Feb. 5-6. AAAA National Awards Committee. Selection of CY87 AAAA National Awards Winners, CY87 'Chapter of the Year', and CY88 AAAA National Scholarship Award Winners. Imperial Inn, Arlington, Va.

■ Feb. 17-18. Lindbergh Chapter. 14th Annual Joseph P. Cribbins Product Support Symposium. Presentation of four '1987 AAAA Industry Awards' and the initial 'Outstanding Aviation Logistics Support Unit of the Year Award.' Airport Hilton Hotel.

April, 1988

■ Apr. 14-17. 30th AAAA National Convention. Cervantes Convention Center and St. Louis Area Hotels.

Jenkins, both of Tenn., have joined AAAA as Sustaining Member firms.

Associate (Industry) Membership

AAR Defense Systems of Elk Grove, Ill, has joined AAAA as an Associate (Industry) Member. Its Designated Industry Representative is Robert G. Carlstrand, Vice President.

AAAA Shield Chapters

AAAA Chapters that have increased their membership in successive quarters, and have received the new 'AAAA Shields':

Two Quarters

Arizona Chapter
Corpus Christi Chapter
Delaware Valley Chapter
Greater Atlanta Chapter
Indiantown Gap Chapter
Lindbergh Chapter
Monmouth Chapter
North Texas Chapter
Old Tucson Chapter
Pikes Peak Chapter
Redcatcher Chapter
Suncoast Chapter
Tennessee Valley Chapter
Washington, DC Chapter
Wings of Devil Chapter
Wings of Marne Chapter

One Quarter

Cedar Rapids Chapter
Colonial Va. Chapter
Leavenworth Chapter
Monterey Bay Chapter
Old Ironsides Chapter
Rhine Valley Chapter
S. California Chapter
Stuttgart Chapter

It's worthwhile repeating!

. . Did you know that since January, 1977, the Army Aviation Association, without any interim dues increase to its membership in the ten-year period, . .

. . has more than halved again its CY77 membership strength of 9,945,

. . has more than quintupled its CY77 General (Emergency) Fund of $19,000?

. . has more than quadrupled its CY77 total of 35 Industry (Corporate) Member firms,

. . has more than doubled the number of its four National Awards,

. . has more than doubled the number of its nine National Scholarship Awards,

. . now provides more than 11 times the annual scholarship aid than it did in 1977,

. . has more than doubled the number of its major worldwide symposia, conferences, and technical meetings,

. . has enjoyed a tenfold increase in its CY77 investment portfolio of $20,000,

. . has undertaken a more than threefold increase in its National Convention attendance,

. . and has instituted 14 major new programs of interest to all members.

This ten-year growth pattern is a direct result of the unqualified support and participation of AAAA's worldwide members - the users, logisticians, and industry and retired members; the dedicated leadership provided by AAAA's national, regional, and chapter executive boards; and the cost-effective administration furnished by AAAA's contract national office staff.

AAAA - the professional association that supports Army Aviation and the Aviation Branch - truly works for you.

APACHE WEATHER

In sleet or snow or rain, no other aircraft can see and fight so well. Even when the weather closes in, the AH-64 Apache can hunt out hostile armor. Its eyes: The Target Acquisition and Designation Sight and the Pilot Night Vision Sensor.

With these eyes, the Apache crew can search out and engage targets in bad weather as well as in good. An on-board video recording system enables the crew to pop up from cover, record target image and location, then return to hiding to verify target identification and plan the attack.

The Apache is the first attack helicopter capable of taking on targets *behind* enemy lines. With low radar, infrared, visual and acoustic signatures, the Apache is well qualified to handle deep attack missions. It can prowl as far as 100 miles into enemy territory to disrupt, delay and destroy advancing threat forces.

Now in service at U.S. bases and with NATO Forces in Europe, the Apache is exceeding Army expectations and requirements. It's brightening the day for U.S. Army commanders while darkening the prospects of those who like us least.

APACHE

Apache owns the night.

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For more information, write: McDonnell Douglas Helicopter Company, 5000 E. McDowell Rd., Mesa, AZ 85205.