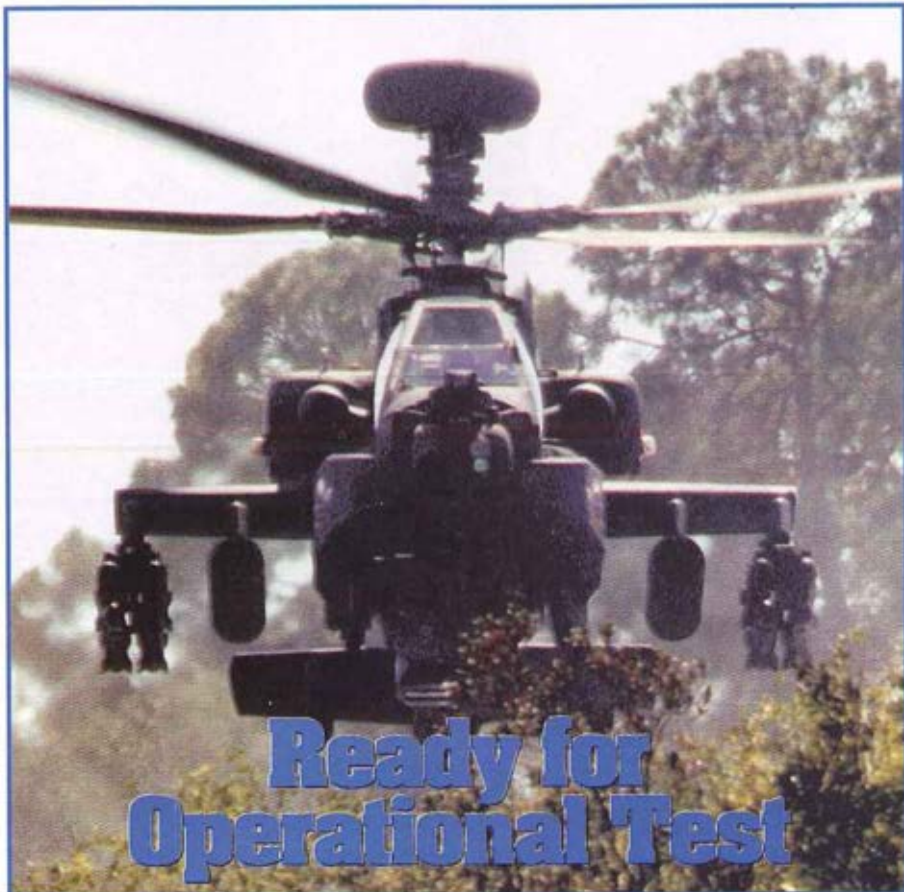


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ARMY AVIATION

OFFICIAL PUBLICATION OF THE ARMY AVIATION ASSOCIATION OF AMERICA • NOVEMBER 30, 1994



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Briefings

The Aviation Applied Technology Directorate (AATD), Ft. Eustis, VA, will celebrate its 50th anniversary on 16 December 1994. The occasion will be recognized with a one-day event including presentations about AATD's history, current and future research programs, facilities tours, and a dinner. For information, contact Jerry Irvine, (804) 878-3272.

Marconi Training and Simulation has been formed following the merger of **Marconi Simulation** and **Ferranti Simulation and Training** after the recent acquisition of parts of Ferranti International by GEC plc. Marconi Simulation and Training's capabilities will cover land, sea, and air defense trainers, and is fully able to meet the requirements for Distributed Interactive Simulation (DIS) systems.

The U.S. Army has announced the selection of **Lockheed Sanders' Air Force Mission Support System (AFMSS)** as the core software for the Army's **Aviation Mission Planning System (AMPS)**. Following a detailed evaluation, the Program Executive Officer, Aviation, MG Dewitt T. Irby, Jr., said that AFMSS will provide the core software and that the development of the Army-specific modules will be managed by his office.

Era Aviation Services, a division of Era Aviation, Inc, hosted a roll-out ceremony at its Lake Charles, LA facility for its External Fuel System (EFS) installed on the first mission capable U.S. Army National Guard UH-1H. The contract consists of providing 53 sets of conformal external fuel tanks and 75 airframe kits to the ARNG. The tanks can be removed or swapped between aircraft as mission or maintenance requirements mandate.

The **Military Acquisition Management Branch**, via a PERSCOM message, has announced that it will be accepting applications for the Army Aviation Experimental Test Pilot Training Program. The deadline for submission is no later than 10 March 1995. Due to recent changes in leader development for experimental test pilots, there are new and exciting career opportunities for aviation officers. Any active duty Army aviator who meets the qualifications specified in the MAMB, PERSCOM Message, Subject: Army Aviation Experimental Test Pilot Training Program Selection Board, can apply for attendance at the United States Naval Test Pilot School. The U.S. Army Aviation Technical Test Center (USAATTC) will be sending program briefing teams to several CONUS installations to provide information briefings and answer questions on the program. For more information, contact USAATTC at DSN 527-4643, or MAMB at PERSCOM DSN 221-2800 after 1 December 1994. Applications for the experiential test pilot program are to be completed in accordance with DA Circular 351-94-1 (DRAFT) and the PERSCOM message.

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FORTHCOMING ISSUES

December 1994 — Army Aviation in the Reserve Components and Army Aviation's Aeromedical Role.

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FRONT COVER

Paid advertisement: AH-64D Longbow Apache prototypes have been deployed to Ft. Hunter-Liggett, CA, where they will complete operational testing in March 1995. The U.S. Army plans to upgrade its entire AH-64A Apache fleet into the next-generation Longbow Apache configuration.



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ROBERTSON

AVIATION
Range Extension Fuel Systems

COMANCHE: CRITICAL TO FORCE XXI

It is a great honor for me to be writing an editorial for ARMY AVIATION. As a former Army officer and aviator, I know what a great audience I reach through this forum, and how important this audience is to the future of the Army's flight programs.

I would like to lay out a sound, reasoned modernization plan leading to fully funded, streamlined programs that field the best equipment to the best Army in the world. I would like to talk about the secure future of Comanche and Longbow Apache. I would like to tell you that a follow-on to the CH-47D is well on the way to coming off the drawing boards and that a new medium lift helicopter is in our future. I would like to relate all of those things and

*The
Assistant
Secretary of
the Army
for RD&A
supports
Comanche
100%.*

sign off with a simple, "Don't worry, be happy!" The current situation just isn't that easy.

Instead, as I write we are fighting hard to preserve the Comanche program that is so vital to Force XXI's reconnaissance and target acquisition

requirements.

No other system can operate day and night, all-weather around the clock and meet those requirements.

The reason why this fight is so hard is pure and simple: a more rapid percentage decline in Army budget than in the other services' budgets. As the Army faces a 50% decrease in RDA funding since the end of the Cold War, it seems that the only thing we hear is "cut more ... cut more." So, I am forced to ask myself, "Can you really justify Comanche?" I believe the

answer is a resounding yes.

Yes, the threat has changed. Yes, the Cold War is over. Do these facts justify halting forward movement in modernization? Can a football team who won last year's Super Bowl stop drafting young talent? Our battles are more numerous and more dangerous now than at any time in my memory since Vietnam. As many as 50,000 American fighting men are deployed, in actual operations, at any one time doing America's business at the risk of their lives.

Operations other than war are not safe operations. They demand intense surveillance, reconnaissance, and security. The broad range of operations demanded of today's Army and Force XXI support a ground superiority platform like the Comanche to meet these needs far more readily than they support a new air superiority fighter aircraft.

Comanche's operational mission as a reconnaissance, surveillance, and target acquisition platform is clearly justified in any scenario. Its night vision capability and stealthiness make it a major benefit in any environment, not just high intensity combat. It will serve us equally in the deserts of Southwest Asia, the rugged terrain of Korea, the combined urban/rural landscapes of Somalia or Haiti, or the rivers and countryside of Rwanda. By detecting and identifying the opposing forces, from terrorists and thugs to full-up ar-

mored formations, the Comanche will save both American and foreign lives. And we will still be able to fight any high technology threat anywhere.

The improved sensors and communications available on this platform will enable the Army's precision strike capability, both close and deep, saving lives and minimizing collateral damage. The Comanche's ability to self-deploy over great distances will support the combat force of choice in any rapid deployment contingency providing security and force protection as we project power worldwide. No other planned capability (Air Force recce, satellites, UAVs, or upgrades to existing Army assets) will provide these strengths. Comanche is justified by its ability to deploy anywhere, anytime, and operate around the clock to support ground troops, thus saving lives.

In this case it does not matter if the enemy has an equivalent capability. Our watchword has got to be OVERMATCH, not match, and that is what the RAH-66 gives us. Here is where we can depend on the support of the American people. They will demand that their mothers, fathers, sons, daughters, siblings, and friends have the best protection possible. We are not talking a one on one match up of aircraft, we are talking about over-matching capabilities that save

lives on the ground, in any environment.

OK. So I firmly believe that over-matching capabilities are justified for the ground force of a power projection military. I also believe that the argument goes beyond simple one to one calculations that may be appropriate when discussing air superiority. Does the Comanche offer the Army and the nation anything else to justify its existence? Absolutely. This aircraft is the technology carrier that we require to move forward into the next century.

From 2d Generation FLIR and Wide Field of View Helmet display to its computer-aided target acquisition system and stealthy, composite airframe, this vehicle will support other programs and bring forward our technologies into the 21st Century.

Why is this important? Some make the argument that good enough is good enough and that current dollars are better spent elsewhere. This argument has been made before. In the 1930s, visionaries in the armor community wanted to develop a new tank. Bean counters saw over 3,000 leftovers from WWI. The bean counters won that argument, and we entered WWII being woefully overmatched by German tanks. In the 1930s, they did not know what the future would bring, and they chose the route that led to no improvement.

In the 1990s, we also do not know

what the future will bring. We can certainly tell from the last five years that it will bring increased deployments of the Army to unenvisioned places around the world. A path that does not improve our capabilities will lead to American casualties. Preparing for the future with improved technologies is justified in its own right, particularly where improvements save our soldiers' lives.

I am not trying to make a case that Comanche development and fielding should receive the same treatment that modernization got in the 1980s. We can no longer afford to spend the dollars on programs as we did to deter Soviet aggression. We can and must hold ourselves accountable as stewards of the public trust. The only way to do that is to move forward with meaningful Acquisition Reform.

Within DoD and the Army, we are already well underway with several critical initiatives. On 13 October 1994, the President took a vital next step as he signed into law the Federal Acquisition Streamlining Act. That law mandates much of what we in DoD and the Army in particular have been working on for a number of years. Commercial specifications will become the norm. Industry-government teaming will be encouraged. Decisions will be pushed to lower levels.

(FORCE XXI — cont. on page 41)

THE NEED FOR VERSATILITY

The former NATO Secretary General, Manfred Woerner, neatly summed up the world today when he said, "The collapse of Soviet communism has left us with a paradox; there is less threat, but also less peace." Current troubling world events in different hemispheres over the past months have reinforced the need for versatility, and I would argue, the relevance of Army aviation.

To see a carrier task force operate off the coast of Haiti with Army helicopters on the carrier decks is but one of many examples of Army Aviation's relevance in a rapidly changing world. Our versatility was demonstrated by the Operation UPHOLD DEMOCRACY Aviation Task Force while other aviation forces were preparing for a possible

*How
Army Aviation
is the key
to meeting
the present
and future
challenges.*

deployment to Southwest Asia — another example of versatility. The dynamic capabilities our systems and people bring to the spectrum of conflict enable us to rapidly shift focus, meet diverse challenges, and employ overwhelming combat power — this is versatility — this is the relevance of Army Aviation.

Army Aviation brings many attributes to the fight which enhance the combat effectiveness of the combined arms team. We provide the maneuver commander a means to better visualize the depth, height, and width of the battlespace resulting in greater synchronization of effort, expanded control of operational tempo, and enhanced control of force application. Aviation also provides mobility, survivability, and sustaina-

bility, ensuring forces are at the right place, at the right time, with the right capabilities. We are integral to the ability to command and control combined arms forces. The bottom line — aviation, performing combat, combat support, and combat service support functions enhances the effectiveness of each member of the combined arms team and is a force multiplier for the entire team.

To illustrate how Army Aviation's relevant capabilities play a central role in not only today's Army, but for the 21st Century Army, one has only to look at the Army's major force design initiative — Force XXI.

Force XXI is a comprehensive approach to redesign the force — organized around information — to be inherently more versatile and flexible. It is defined by five characteristics: doctrinal flexibility, strategic mobility, tailorability and modularity, joint and multinational connectivity, and the versatility to function in war and in Operations Other Than War (OOTW). Army Aviation I would argue, possesses these characteristics.

Another critical component of Force XXI is the harnessing of system and information technologies. Army Aviation is at the vanguard of

change in this critical warfighting area. The efforts of MG Dewitt T. Irby, Jr., PEO, Aviation, and his folks to incorporate information technologies into the Kiowa Warrior, Longbow Apache, and the Comanche has led an important shift in the Army's modernization strategy, the primary imperative being the gaining and dissemination of accurate and timely information.

By mastering information, we can drive the operational tempo and control the environment thus winning the information war.

GEN Sullivan recently stated, "In our tactical units we will use information-age technology so that we can maneuver faster and mass fires more effective-

ly. Individual weapons systems will be more potent. The digitization of the battlefield — the electronic linking of every weapon system in the battlespace — will allow the commander to synchronize all the elements of combat power with devastating effect."

Being on the cutting edge — at the vanguard of technological advancements is crucial to our nation's security. The evolution of technology cannot be halted — today's strate-

"Aviation ... enhances the effectiveness of each member of the combined arms team and is a force multiplier for the entire team."

THE NEED FOR VERSATILITY ...

- RAPIDLY SHIFT FOCUS
- MEET DIVERSE CHALLENGES
 - SIMULTANEOUS OPERATIONS
 - EFFECTIVELY TAILOR FORCES
 - OVERWHELMING COMBAT POWER



**THIS IS
VERSATILITY ...**



**THIS IS THE
RELEVANCE
OF ARMY
AVIATION ...**



**CRITICAL TO THE
ARMY'S
MODERNIZATION STRATEGY**

tegic landscape is shaping the requirements of tomorrow. Comanche, Longbow, and Kiowa Warrior are critical components of this technology evolution not only for Army Aviation, but for the entire combined arms team and our nation.

Force XXI will create the Army for the next century. It maintains the Army's institutional relevance and provides a vision to tackle the challenges of the 21st century. Inherent to Force XXI operations is the tenet of versatility — Army Aviation has proven its versatility in combat and OOTW. That versatility takes form in the employment of aircraft and systems,

but also in the continued development of agile minded warriors. After all, it is the soldier that makes it all happen. It is the aviation soldier who will apply superior information-age technology to gain the decisive edge against any potential adversary.

As we watch the world news, the dangers of this new era are readily apparent. We must stay relevant. At all levels we must be ready for the unexpected. Stay sharp, stay focused, and stay ready!

★★

MG Adams is Chief, Aviation Branch and Commanding General, U.S. Army Aviation Center (USAAVNC) and Ft. Rucker, AL and Commandant, USAALS.

THE CHALLENGE AHEAD

Army Aviation is sitting on the brink of one of the most promising opportunities we have ever encountered — the potential for using leap-ahead technologies to leverage our contribution to the combined arms battlefield of the 21st Century. Yet, at the same time, we see a tremendous challenge to our required funding resources, and our planned force structure of the future. With reduced defense spending and a reduced force structure looming ahead of us, it is incumbent on us all to meet this challenge and be good stewards of the resources that have been entrusted to us.

With this in mind, I continue to maintain the vision that there are four key tenets that must be addressed when committing resources to the Army Aviation program. To make the

Leap-ahead technologies can be applied in an austere spending environment.

cut line, resource expenditures must contribute to at least one of the following attribute areas:

- Capability
- Safety
- Survivability
- Sustainability

These tenets are continuously applied to our new develop-

ment systems, the RAH-66 Comanche, the AH-64D Longbow Apache, and the MH-60K/MH-47E Special Operations Aircraft (SOA); as well as modifications to the OH-58D Kiowa Warrior, the AH-64 Apache, the UH-60A/L Black Hawk, and the CH-47D Chinook.

Needless to say, we have a full plate. I would like to take this opportunity to describe the PEO, Aviation approach to meeting this challenge, and getting the most results for our resource investments. Having said

that, then where are the most promising opportunities to achieve these objectives in the future?

Digitization. In the area of Battlefield Digitization, one of the key leap-ahead technologies, the Aviation Campaign Plan is going forward at full strength. The National Training Center Rotation 94-07 was our first large exercise with digital equipment. The Aviation Brigade of the 24th ID took the prototype of the Army Airborne Command and Control System (A2C2S), digitized Apache attack aircraft and an upgraded ground operations center into "combat". Their After Action Review supported our conviction that our projects are on the right path from the user's perspective and the user is looking forward to the fielding of the objective, fully capable systems.

In the Aviation fleet of the year 1999 we anticipate the Force Package I units to be equipped with the seven Battlefield Digitization projects:

- Global Positioning System inputs for position, heading, and communication timing;
- Improved High Frequency radios for long range communications;
- Have Quick II improvements for secure and digital message capabilities for UHF air-to-air communications;
- The Improved Data Modem for target handover by digital messages through the Combat Network Radios;

- The Army Airborne Command & Control System to be installed on UH-60 aircraft for commanders from corps to brigade;

- The Aviation Mission Planning System for rapid and effective mission initiation and mission rehearsal with digital map capabilities, and;

- The Aviation Tactical Operations Center to provide a site for tactical operations planning including connectivity from the Army Battle Command System down to digitized data loading of the aircraft via the mission planning system through cartridges.

Battle Labs. Several TRADOC sponsored Battle Lab experiments are in coordination to further refine the design and development of these and other digitization projects. Aviation's participation will be in Operation DESERT CAPTURE III, an armor exercise which will emphasize air-ground data connectivity. This experiment will occur in August 1995 at Fort Knox, KY. Another is the Brigade XXI experiment where our prototype systems will interface with a digitized brigade for a full scale proof of concept featuring improved situational awareness and data communication systems. Brigade XXI is expected to occur in late 1996.

2003 and 2005 Boards. In addition to the Battle Lab experiments, we are striving to improve our combat effectiveness by looking at more than just the materiel solutions. We

have seen that more progress is gained if the entire Doctrine, Organization, Training, Leadership Development, Materiel, Soldier (DOTLMS) environment is considered as the single unit that they are.

For six months, a group of retired senior Army commanders looked at emerging technologies being applied to the Army Aviation systems. This 2003 Board looked at the combat capabilities aviation will bring to the battlefield beyond the turn of the century. The board concluded we are on track, and that these technologies may be equally important to the entire Combined Arms Team. Secondly, the Combined Arms Team must work together to maximize the contribution of each mission area.

As a follow-on effort, a 2005 Board has been formed to look at the "real" information requirement of the combat force and the emerging technologies that will enable the combat team to exchange this information. In that vein, we are teaming with the Armor, Air Defense, and Intelligence Centers, as well as the respective Procurement Executive Offices to evaluate our ability to "see" and "control" the airspace above the battlefield. The task of improving Army airspace command and control has been assigned to Fort Rucker, AL but it must be a combined effort of all the participants. To assist the evaluation, we have established an "Aviation-Armor Red Team". The Commanders

and PEOs will establish guidelines, and the 2005 Board will provide an assessment of emerging technologies which will propel the battlefield functional areas into tomorrow's combat arena with the maximum combat edge available for quick, decisive victories.

Non-Developmental Items (NDI).

Having discussed the advantages of capturing new emerging technologies, I would now like to turn to another approach to meeting our requirements, the commercial or non-developmental item approach.

The New Training Helicopter (NTH) has been a tremendous success in using an NDI commercially available item to meet a military requirement. The TH-67 has proven to be an effective initial entry rotary wing (IERW) trainer at Ft. Rucker, AL, and is achieving anticipated savings in reduced operating and support costs, while meeting or exceeding all requirements of the initial entry training curriculum. We are receiving excellent reports on the effectiveness of the total system. It's a fuel efficient, low maintenance aircraft that will reduce considerably the cost of IERW training. An NDI success story.

We are also maximizing tri-service coordination and joint projects to take advantage of available solutions and minimize the cost of development, while taking advantage of technical advances already accomplished by other services. Many of the digitization projects

described above are joint projects with the Navy and/or Air Force.

With the new thrust to use non-military specifications and standards, there are other opportunities as well. The DoD thrust is to take advantage of the open system architecture approach and use commercial standards to the maximum extent possible. This will enable the DoD to leverage commercial technology and design approaches while gaining the benefits of Commercial-Off-The-Shelf (COTS) and NDI technology to reduce weapon system design, acquisition, and operational costs.

It is anticipated that commercial advances in software, simulation, com-nav electronics, displays, and other state-of-the-art items will offer DoD the opportunity to capitalize on the commercial marketplace to meet military requirements.

Our challenge is to work closely with industry to ensure that as industry standards are established, they address any unique DoD needs, and promote military use of COTS, NDI and dual-use materiel.

Battling Obsolescence. As the aviation fleet is drawn down to our target fleet size of approximately 5000 aircraft, we will continue to retain a significant number of the older UH-1, AH-1 and OH-58 A/C/D aircraft well into the 21st Century. These aircraft all have significant shortfalls in the four at-

tribute categories identified earlier in this article. It is essential that we maintain an aggressive procurement program to fill out our objective fleet of RAH-66, AH-64D, UH-60A/L and CH-47D; and, retire the older aircraft at the earliest practical time. Continuing to retain the older systems in the inventory will result in having aircraft that cannot perform to requirements, nor survive in the future threat environment, and become insupportable.

Sustainment — 2000 and Beyond. The RAH-66 and the AH-64D will be well positioned with the latest technology and maintenance concepts at the turn of the century; however, the UH-60A/L and CH-47D are in need of a sustainment program. The first production UH-60 aircraft will be over 20 years old at the turn of the century, and the CH-47 airframe will be 40 years old (20 years as a D model) as well.

The PEO, Aviation and the Directorate for Combat Developments at Ft. Rucker are laying out a plan to define a sustainment program for the lift fleet consisting of the CH-47 and UH-60. The configuration and performance requirements for these aircraft fleets will be firmed up during the ongoing studies. In addition, the proposed UH-60Q MEDEVAC aircraft will be included in the modernization scenario to meet the identified

shortfall in the medical fleet. The objective of these efforts is to define practical and affordable programs that will sustain these aircraft systems well into the 21st Century.

Although special emphasis is being placed on the two systems discussed above, all PEO, Aviation systems are being targeted for candidate O&S cost reduction efforts, and aggressive Value Engineering Change Programs (VECP). I have challenged each of my PMs to establish a continuous and active VECP effort to reduce the cost of their system.

Foreign Military Sales (FMS).

With the decline in our production base, and more and more reliance on interoperability and joint operations with our allies, FMS has taken on even more importance. I have formed a small International Operations cell, under the direction of COL Thomas E. Reinkober, within the Program Executive Office. Their mission will be to manage and provide assistance, guidance, and direction for Aviation PMs participation in international cooperative, FMS, co-production, and other technical exchange programs and other Security Assistance.

This cell will be responsible primarily for doing all of the pre-case work for the various FMS cases and ensures that the Aviation PMs get the proper resources through Security Assistance to manage the

various cases.

The importance of FMS cannot be overstated. For example, at this time, FMS makes up the majority of our production aircraft for the Apache. Two upcoming cases for the sale of Apaches to Kuwait and Egypt will bridge the gap between the AH-64A and AH-64D Longbow production line. A production break would cause a significant cost increase to the Army if this gap is not filled. Currently, we are working with Sweden, the Netherlands, United Kingdom, Kuwait, and Egypt for additional aircraft sales.

I am looking to my International Operations cell to give me recommendations on how to streamline the FMS process and to provide a focus and expertise for Program Executive Office, Aviation in International Operations.

The PEO Aviation Team. This issue of ARMY AVIATION Magazine includes articles from each PMO within PEO, Aviation. They provide an update on what is happening currently for each program, activities planned for the future, and each systems contribution to the overall game plan. As we all sharpen our pencils to get the most bang for our buck, the PEO, Aviation is ready to meet the challenge.

★★

MG Irby is the Program Executive Officer, Aviation, St. Louis, MO.

RAH-66 COMANCHE: CENTERPIECE OF THE PEACEKEEPING FORCE

You will be called upon in many ways in this new era to keep the peace, to relieve suffering, to help teach officers from new democracies in the ways of a democratic army, and still ... to win our wars."

—PRESIDENT BILL CLINTON, West Point, NY, 29 May 1993

Recent events in Bosnia, Somalia, and Haiti offer a glimpse of the future and an insight into the many challenges facing the U.S. Army of tomorrow. Training and Doctrine Command Pamphlet 525-5, *Force XXI Operations*, provides a 21st Century vision where "...the Army will function in the future as the primary land force executing joint, multi-national operations in War and Operations Other Than War (OOTW) to achieve established objectives in operations

Comanche has been designed to be the quarterback of the digitized Army team.

where domination of terrain or control of the population is central to victory."

We live in an information age. Information Age technology will be the cornerstone of battlefield success. Digitized communications and imagery make field

phones, grease pencils and kneeboards obsolete. However, we must "harness the power of information."

Much like the concept of MASS, we must provide the right information at the right time to the right commander. The Comanche helicopter is designed to quarterback this digitized, information-age battlefield. As the quarterback, Comanche will acquire and process target data and information through a digitized network of national and tactical assets, while developing the situation con-

sistent with the "commander's intent." We must organize around information, sharing knowledge to dominate, control and win.

Early Entry. The Comanche is well-suited for the early entry modular force concept that tailors the force to meet each contingency. With revolutionary deployability — ship board compatible and self-deployable up to 1,260 nautical miles — the Comanche crew can immediately assess the situation and provide the commander a clearer view of the potential battlefield. At longer deployment ranges, eight Comanches can be transported in an Air Force C-5 and put into action in less than 22 minutes — no test flight or boresight required!

Equipped with second generation sensors, pinpoint navigation, and precision guided munitions, the low-observable Comanche can conduct 24-hour "contingency reconnaissance" missions capable of digital target handoff to long-range artillery, naval gun fire or autonomous engagements of high-value and/or relocatable targets. Comanche's unequaled battlefield processing power allows for leap-ahead target recognition and identification, reducing the risk of fratricide. As an early entry team member, Comanche comes prepared for the long haul, with a fraction of the support and sustainment equipment and manpower required to support our current fleet.

Comanche's extended ranges, high

reliability, and mission flexibility also make it well-suited for vital force protection measures during the joint force build-up.

Armed Reconnaissance. Comanche's advanced technology will enable it to absorb and process battlefield information in a way that the existing light fleet simply is not able to do. Existing recon aircraft are not able to fly at night or in adverse weather and they are unable to collect data quickly enough to provide a battle commander with critical information that will allow him to make the right decisions, right now.

Other critical deficiencies that Comanche will resolve are the inability of current light aircraft to defend themselves (limited air-to-air capability), inability to self-deploy and difficulty to maintain. Comanche will perform armed reconnaissance missions by reconnoitering and locating adversaries, securing flanks and weak areas, finding relocatables and providing a coordination function for the combined arms team. Because Comanche is an armed reconnaissance helicopter, it will be able to strike deeper into and beyond the battle zone and also be able to provide a security presence on the flanks and support areas.

In the attack role, Comanche's advanced sensors will be able to acquire targets first and fire first, easily disrupting and destroying operational reserves, as well as providing rapid rear area protection.

A major benefit is mission and payload flexibility. Six integral launch rails, each capable of firing one Hellfire, two Stingers or four Hydra-70 rockets contribute to the aircraft's low signature while add-on-wing stores can be mounted to increase fuel or weapons load.

When employed in an armed reconnaissance role, Comanche has no equal. Comanche becomes the eyes and ears of the Division Commander, on call 24 hours a day in all weather. We have all learned the value of reconnaissance at the NTC where there is a 95% correlation between the effectiveness of the reconnaissance and the success of the attack.

During Operation DESERT STORM, the majority of combat operations were meeting engagements. We must do a better job of finding the opposing forces, shaping the battlefield and exploiting their weaknesses.

As a member of the combined arms team, Comanche extends the Division Commander's combat potential to an unprecedented depth. Not only will we know where the enemy force is, but through constant reconnaissance and target identification, we will know where they are going and what they might do. As a complement to our attack fleet, the Comanche will choose routes through the battle area for the heavier Apache attack aircraft, while handing-off targets for destruction.

Comanche's digital view of battle makes it a trusted partner of the reconnaissance-attack team, creating a lethal force synergy never before seen on the battlefield.

Comanche offers multi-mission capability which becomes so important in the face of force reductions and force structure downsizing.

Supportability. Unlike past weapon system acquisition programs, the RAH-66 Comanche places supportability on an equal plane with technical considerations. Supportability is divided into three major sections:

- Reliability, Availability and Maintainability (RAM);
- Integrated Logistics Support (ILS);
- and Manpower Personnel Integration (MANPRINT).

The RAM requirements for the Comanche are driven by the Army's desire to maintain a 24-hour presence on the battlefield while significantly reducing the maintenance and logistics burden. This will be achieved by taking advantage of hardware improvements like composite structures, drive train/rotor components, functional partitioning, fault tolerance designs and self-healing modular mission equipment package architecture.

The self-healing architecture, coupled with improved diagnostics and on-board data recording, will reduce false alarms and erroneous removal of components. The number of parts comprising the airframe,

drive, rotor and flight control subsystems will be significantly less than in predecessor aircraft. Consequently, Comanche will be simpler, easier to maintain and less vulnerable to failure.

The ILS program focuses on influencing the design to ensure the shortest possible logistics tail.

Through the Logistics Support Analysis (LSA) process, the problems impacting ILS are surfaced and resolved, thus driving the design to achieve the highest operational readiness at minimal cost and resource utilization. Repair Level Analysis (RLA) performed on all Line Replaceable Modules and Line Replaceable Units have determined whether a component should be repaired or discarded upon failure.

The primary design driver has been the Comanche's two-level maintenance concept. Its primary objectives are to allow maintenance to be performed at the lowest possible level. Two levels of maintenance, user and depot, eliminate the need for highly skilled personnel and equipment traditionally located at the intermediate level.

MANPRINT is the synchronization, convergence and synergistic combination of six major developmental areas: Manpower, Personnel, Training, Human Factors Engineering, System Safety and Health Hazards Assessment. Since its inception, the Comanche program has en-

sured that MANPRINT has been totally integrated into the system.

MANPRINT specialists have consistently participated in technical, supportability and program level reviews and have employed computer modeling and simulations to pinpoint areas of concern.

Additionally, representatives from both the Army and the contractor have participated in and evaluated hardware maintenance demonstrations. Consequently, skills levels have been optimized resulting in decreased quantitative and qualitative requirements. Because of its iterative approach, the MANPRINT influence will continue to follow the Comanche throughout its life-cycle.

Budget shortfalls in the program funding stream were identified last fall that could have seriously impacted progress in the out-years.

A combined Government/Industry process action team was initiated to explore streamlining ideas, focusing on application of lessons learned from prior development programs. The most significant aspect was elimination of all Dem/Val-specific tasks or work reports that would have to be re-done during EMD.

Innovative ideas and concepts were applied wherever they made good sense. Military standards and specifications were eliminated or modified "for guidance only" in order to assimilate commercial business (COMANCHE — cont. on page 37)

OH-58D KIOWA WARRIOR: A BRIDGE TO THE FUTURE

The OH-58D helicopter continues to evolve since its debut in 1986 as the Army's first true night scout.

The Kiowa Warrior now serves as the "near-term" solution for the Army's critical armed reconnaissance mission. Currently, it is being fielded to the high priority, contingency units (air cavalry and light division attack battalions) in an attempt to bridge the armed reconnaissance gap until the objective system for Force XXI, the RAH-66 Comanche, comes on board in 2003. Current procurement authorization has been brought to a total of 383 aircraft against a validated procurement objective of 507 aircraft.

Operationally, the OH-58D Kiowa Warrior performance has been nothing short of superb, and the field has come to depend upon it. Specifical-

*OH-58D is
the aircraft of
choice for
insertion of
emerging
digital
technologies.*

ly, Kiowa Warrior has demonstrated:

- Sustained operation requirement of 80% compared to the DA rate of 75%.
- Hellfire hits at better than 90% direct hits based upon 91 hits out of 101 firings to date.

● Successful launching of the first airborne Air-to Air Stinger (ATAS) RMP Block 1 missile, scoring a direct hit on a full scale Hind Replica Target on 17 September 1994.

Additionally, the Data Transfer System (DTS) pays big dividends to the field commander in terms of reduced pilot workload, and increased flexibility in planning and responding to the dynamics of the battlefield.

According to previous task force commanders at the National Training Center, the day/night target acquisition technology provided by the Kio-

wa's Mast Mounted Sight system provides new dimensions to the battlefield and renders an incomparable quality of situational awareness that they have come to rely upon.

As a bridge to the future, Kiowa Warrior system improvement decisions are made on the basis of what is absolutely essential to sustain the system and maintain its mission capability edge until the Comanche assumes its role. Simply put, only those improvements which offer the highest return on investment in terms of safety, survivability, capability and operating and support cost reduction will see their place within the Kiowa Warrior of the future.

The battlefield in the "near term" future will be characterized by technologies that provide real time situational awareness. These technologies will unite the battlefield digitally both horizontally and vertically.

Master Controller Processor Unit (MCPU). The MCPU design is fast approaching its design limitations. The mission equipment package and control system software of today tap out more than 90% of the existing system's capability to function. Additionally, future supportability of the existing processor is questionable given the rapid advances of technology and the need to stay compatible with the technologies available from industry.

Contracts have recently been awarded to develop and subsequently implement a state-of-the-art pro-

cessor upgrade which will significantly reduce life cycle software support costs using ADA, and will more than double the system capability of the Kiowa Warrior. This will result in an approximate weight savings of 20 lbs, power reduction of 70 watts, and reduced recurring and support costs.

The MCPU upgrade also includes the benefits of two "rider" technology improvements which include digital map and video downlink (VDL). The digital map or Rotor Mapping System (RMS) will provide the crew with the ability to display both a plan view aeronautical chart and a plan view geographical terrain image which will allow for the overlay of symbology/test, map-aligned way points, targets, flight plan, and battlefield graphics. Both views will provide for the inclusion of predefined cultural features such as roads, powerlines, and structures. The VDL improvement will enable near real time still frame video imagery taken by the MMS to be downlinked to airborne/ground stations using existing FM communication links. The VDL system supports 15 stored images and will feature a "selectable send" capability.

Production incorporation for the upgraded MCPU is earmarked for Lot XII (FY 96) aircraft.

Improved Mast Mounted Sight Processor. The MMS processor enhancement takes advantage of the Advanced Research Projects Agency

(ARPA) Gallium Arsenide chip insertion program. The chip, when combined with the Engineering Change Proposal (ECP) for the improved video processor, results in a high speed, improved tracking capability that allows target track in both TVS and TIS simultaneously, low contrast target track, multi-target (up to six) track, moving/stationary target cue. The video displayed to the operator will be improved, while providing him with split-screen (TVS and TIS simultaneously), freeze frame, and real-time TV zoom (2x/4x magnification). Currently, the plan is to introduce IMSP via Lot XII (FY 96) production deliveries and retrofit, on an attrition basis.

Improved Navigation System and Digital Communication Modem. Two very exciting changes are the addition of an Embedded Global Positioning System, Inertial (EGI), and an Improved Data Modem (IDM).

The EGI will replace the current Altitude and Heading Reference System (AHRS) as the primary navigation system. The EGI is a composite system, consisting of Ring Laser Gyro, Inertial Navigation, and an embedded GPS (GEM III) Card. The EGI system will provide outputs of linear and angular acceleration, velocity, position, altitudes, magnetic and true heading, altitude, body angular rates, time taps, and time. The EGI, through the GEM III card, features such things as a five-chan-

nel LT/LZ P(Y) Code, Selective Availability/Anti-Spoofing (SA/AS); anti-jam capabilities to 65 dB Jammer/Signal, and Precise-Time-and-Time Internal (PTTI) interface. Additionally, the EGI MTBF will be 6500 hours as compared to approximately 405 hours for the AHRS/ASN-43 Magnetic Compass combination.

The Airborne Target Handover System will be replaced by the Improved Data Modem (IDM). The IDM provides for a faster communication rate (16,000) versus 1,200 bits/sec and permits recognition of and operation within Multiple Joint Message Protocols (Army, Air Force, and Marine Corps). The IDM will interface with the onboard keyboard, display and mission computer and will be capable of transmitting or receiving data on four radios simultaneously. Both the EGI and IDM are projected to be incorporated sometime within Production Lot XII (FY 96).

Aviation Mission Planning Station (AMPS). Briefly, AMPS is a planning/battle synchronization tool which automates aviation mission planning tasks such as route generation, performance planning, communication planning, terrain analysis, and data transfer. The current AMPS or Interim AMPS will serve as the mission planning test bed for the fleet objective AMPS. The fleet objective AMPS will be an Air Force Mission Support System (AFMSS) based system. Presently, the objective

AMPS system is planned to begin fielding late summer of FY 96.

RAMEP (SCOOPS/FADEC). A major (in-process) improvement is the Engine Reliability and Maintainability Enhancement Program (RAMEP). RAMEP is comprised of two phases, the end objective of which will be the benefit of a 19% increase in power to improve high/hot day (4000 ft/95°F) performance, improved stall margins, and restore TBO from the current 1,000 hours to 1,750 hours. In conjunction with the RAMEP, rocket blast deflectors or scoops have been developed and will play an integral part in RAMEP reducing surges induced by ingestion of hot exhaust gases associated with rocket firing and tail wind conditions. These scoops will improve current tail wind limitations back to the original 35 knots and lift the restriction on rocket firing at a hover.

By March FY95, the RAMEP Phase II engine is expected to be certified by the FAA with production incorporation in FY 96.

Associated with the RAMEP Phase II is an aggressive effort to develop and incorporate a Full Authority Digital Electronic Control (FADEC). The FADEC will moderate the current engine/rotor droop problem, which in turn, should clear the way for the aircraft gross weight to increase to 5,500 lbs. Secondly, FADEC will provide significant operation and support cost savings

by virtually eliminating hot start problems and saving on wear and tear of the engine. A 25-30% increase over the RAMEP II TBO of 1,750 hours is expected.

High Frequency (HF) Radio (AN/ARC-220). The AN/ARC-220 will replace and is backward compatible with the AN/ARC-199. The new radio will provide secure, non-secure voice, and digital Non-Line-of-Sight Communication at NOE altitudes. Other features include Electronic Counter-Counter-Measure (ECCM) (voice and digital data) and embedded Automatic Link Establishment with linking protection. Additionally, the ARC-220 will interface directly with the IDM, and communication security requirements will be provided by use of the KY-100.

The Kiowa Warrior AN/ARC-220 "Test Bed" effort is currently anticipated to commence sometime during 2nd quarter FY 95.

The Kiowa Warrior will continue to provide an ideal test bed for technologies that have broader application than just a single weapons system.

Until Comanche takes its place as the Army's primary armed reconnaissance helicopter ... Kiowa Warrior will be there, armed and ready! **SCOUTS OUT!!**

★★

MAJ Coutteau is the APM for Programs, Kiowa Warrior, St. Louis, MO.

UTILITY HELICOPTERS — A TEAM APPROACH

If the UH-60 Black Hawk were to be designed in today's environment the requirements would be vastly different than they were back in the 70s. The Black Hawk has evolved over the last 20 years to be the most widely utilized aircraft in service today, performing special missions for each of the services and 17 foreign countries. Our challenge for the future is how to find commonality among the diversity.

While we have all used teams to solve problems, the definition of a team approach in this case extends beyond just membership. It includes understanding and utilizing the best aspect of the various improvements that have been developed by a multitude of sources. In the last five years there have been tremendous increases in special applications developed to sup-

*What
lies ahead
for the
world's most
versatile
utility
helicopter:
the UH-60
Black Hawk.*

port specific missions for the H-60 fleet. Some examples include Special Operations configured MH-60L and MH-60K; CINCHawks providing CINC support worldwide; Embassy Hawks which fly the Beirut Air Bridge mission; Enhanced Hawks used in unconventional warfare roles in Korea; specially configured UH-60s deployed to Operation Provide Comfort; the USAF's MH-60G PAVE HAWK, and the HH-60J Coast Guard Jay Hawk which is a derivative of the Navy's Seahawk.

Many of those developments provide the technology desired for the future plans for modernizing the UH-60 fleet. Anyone can develop special configurations, but the objective here is to provide the ability to create unique mission configurations using common com-

ponents, much like today's commercial market.

Team Hawk. This multiservice effort has resulted in numerous recommendations for merging requirements and standardizing both parts and data. It is clearly understood by all members that only through decisions as a DoD community will the H-60 fleet be fully supportable and remain a key element in tomorrow's defense structure.

Thus far Team Hawk's most notable accomplishments are savings generated through the services adopting common parts. We have also shared information on electronic technical manuals and cost savings generated by improvements which reduce operation and sustainment costs by increasing reliability. Savings to date are \$2.3M with a potential savings of over \$100M in sustainment costs from our first Joint Engineering Change Proposal. Team Hawk meets formally every four months, but the team approach has already significantly increased the day-to-day interaction between each services' staffs.

Wide Chord Blade. One of the most encouraging developments which has emerged during Team Hawk discussions is the Wide Chord Blade program. With potential application to both Army and Navy configurations, the Wide Chord Blade offers additional lift capacity and increased range at higher gross weights. Sikorsky is developing the new blade which includes a tapered

anhedral tip (swept down and aft) under Sikorsky funded Independent Research and Development program. The Army has teamed with Sikorsky by providing an aircraft under a no fee lease and a Cooperative Research and Development Agreement to use for development testing.

Thus, for no up-front development funds, the Army gains access to Sikorsky's development test data which can be used during future blade qualification efforts.

Another team effort involves a coordinated plan to develop a modernization strategy for the Black Hawk and Chinook fleets. In coordination with ATCOM's Directorate for Advanced Systems and USAAVNC Directorate for Combat Developments, PM CH-47 and PM Utility Helicopters, have chartered a Cargo/Utility Helicopter Lift Study which will validate requirements for developing modernization plans for the UH-60 and CH-47. The result of the study will be modernization alternatives which will be subjected to trade off analyses and Cost and Operational Effectiveness Analyses.

Digitization of the Battlefield. Digitization of the Battlefield and horizontal integration of aviation assets requires improvements in situational awareness and command and control. During DESERT STORM, experience with the AN/ASC-15B Command and Control systems installed in the UH-60s and emerging technology has resulted in a recog-

nized need for improvements. PM Aviation Electronic Combat has teamed with PM Utility Helicopters to integrate the future Army Airborne Command and Control System (A2C2S) into a new command and control Black Hawk.

One of the exciting technologies emerging from the development of A2C2S is the Enhanced Communications Interface Terminal (ECIT) which is being developed by Naval Research Laboratories. Since ECIT incorporates the functions of multiple communications and navigation components in one box, it can significantly reduce avionics weight and cost therefore giving potential not only for A2C2S but also for the UH-60 modernization program.

EH-60 Advanced Quickfix. PM Utility Helicopters has also teamed with PM Signals Warfare in the Advanced Quick Fix Program. A total of 66 EH-60 Quickfix Special Electronics Mission Aircraft are currently fielded. PM Signals Warfare manages the mission equipment while PM Utility Helicopters manages the airframe. PM Signals Warfare has developed a major upgrade to the mission equipment package with three prototypes already completed. PM Utility Helicopters is responsible for upgrading engines, transmissions and other airframe components. Approximately one half of the EH-60s will eventually be upgraded to the new "Advanced Quickfix" configuration.

MEDEVAC. For the past year a

team comprised of representatives from the U.S. Army Medical Department Center and School, USAAVNC, TRADOC and Utility PMO has refined the requirement and defined the configuration for the UH-60Q MED-EVAC. The acquisition strategy is based on a three phase program with the initial phase having been the development of a demonstrator aircraft to show the viability of utilizing available commercial technology.

The next phase, planned to begin in FY95, will qualify each of the components, integrate them into a UH-60A and perform the various component and aircraft qualification tests. The conclusion will be a three to five year kit production and installation phase on aircraft assigned to the contingency forces.

We will continue to seek commonality within the future H-60 fleet. One of the most important lessons learned from the team effort has been the need to balance all aspects of a program. The improvements in technology are of little value if they are not accompanied by adequate training, mission availability and integration into planning for future combat missions. Today's reduced resources demand improved capability at a more efficient level of expenditure in both acquisition and operation and support resources.

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COL Rees is the Project Manager, Utility Helicopters, St. Louis, MO, and Mr. Miller is the Business Management Chief, Utility Helicopters, St. Louis, MO.

THE APACHE ATTACK HELICOPTER

Change and flexibility are the two axioms that we all find ourselves living by these days. BG Snider's recent promotion and assumption of the duties of Comanche PM accelerated the consolidation of the Apache and Longbow offices a year ahead of schedule. The consolidation change led to a name change for the new organization: Apache Attack Helicopter (AAH). COL Atwell has assumed the duties of Project Manager of the new AAH organization.

This organization, comprised of three technical divisions (System Engineering, Airframe, and Mission Equipment Divisions), provides the most efficient means of managing the complexity of multiple stages of the acquisition life cycle.

We are simultaneously executing a

*Consolidation
and
streamlining
promise to
give the
entire Apache
program
more punch.*

program that is in a development/test, fielding, and sustainment phase, each requiring a special technical expertise. This organization will continue to manage the Modernization, Fire Control Radar (FCR), "D" model, and Foreign Military Sales programs.

For a decade, the Apache has provided the Combined Arms Team with a weapon system with proven combat effectiveness. The sophisticated threats and weapons Apache units will encounter in the next decade require modernization of the AH-64A to continue to provide this decisive edge. Until the AH-64D Longbow is fielded in quantities that can influence the battle, the upgraded AH-64A+ will continue to be the Army's front line combat helicopter. The A+ program includes improvements to the 30mm

gun, Target Acquisition Designation System/Pilot Night Vision System (TADS/PNVS) enhancements, the Embedded GPS Inertial Navigation System (EGI), Fire Control Computer (FCC) improvements, Alternate Laser Code (ALC), and the HF radio.

The Area Weapons System (AWS) reliability and Accuracy Improvement Program (AIP) has yielded abundant results. The AWS reliability problems were resolved by redesign of numerous components. The fleet retrofit is being accomplished using two kits. Two-thirds of the fleet has been fitted with kit one while kit two retrofit begins in December 1994.

There are seven reliability/improvement enhancements for the TADS/PNVS underway. One of the enhancements was a change to the autotrack function to improve reacquisition after breaklock, while another improves the TADS W1 "funny" harness and the PNVS W10 harness. Retrofit by attrition began in April 1994 and will complete by September 1998.

The introduction of the EGI allows the Apache to cover the depth of the battlefield by conducting precision strikes at close or deep ranges. MDHS was awarded a contract to integrate the EGI via retrofit kits. The contract will produce 18 kits per month available for retrofit NLT June 1996. 500 kits are scheduled for installation NLT October 1998.

As part of the EGI Engineering Change Proposal (ECP), we will procure the Aviation Mission Planning System (AMPS), complete with the data transfer receptacle and data cartridge which are used in the AH-64D. This ECP is only applied to those aircraft that have the ASN-137 Doppler modification. Aircraft with the ASN-128 Doppler will not have this ECP and will wait until the Longbow modification to have the EGI ECP installed.

The improved FCC increases memory size, and processing speed; eliminates the battery and inherent failures (weapons lockup), and provides for better gun accuracy coupled with turret control box modifications. Retrofit will begin in November 1994 at a rate of 18 to 24 kits per month.

Alternate Laser Coding capability is under development to counter a threat capable of redirecting the Hellfire missile from its intended target. This is a 22 month RDTE project which started in April, 1994.

The next generation HF radio, AN/ARC-220, produced by Rockwell/Collins, will enable you to have reliable, secure, Non-Line-of-Sight (NLOS) communications out to 300 KM at NOE. Additional features of the HF radio include Automatic Link Establishment (ALE), an embedded data modem, and up to ten formatted or free text messages for digital transmission. PM-AEC is

planning Apache integration commencing 1QFY97.

In the next two year period (1 Aug 94 to 1 Aug 96), the U.S. Army will receive only ten AH-64A Apaches from the production line at MDHS. The other 62 aircraft will go to foreign customers. The impact of international sales on the AH-64D Longbow acquisition program is critical. We will examine its criticality by reviewing the importance of security assistance programs and demonstrating their impact on the acquisition costs associated with the AH-64D.

There are numerous benefits associated with strong U.S. security assistance programs:

- Help friends and allies deter aggression.
- Develop a bond with friends and allies against mutual adversaries.
- Improve our ability to fight with our friends and allies through interoperability and standardization.
- Foster regional and international stability.
- Enhance U.S. defense production capabilities and efficiencies.

Strong foreign sales represent an outstanding opportunity to protect a warm industrial base while reducing the cost of existing weapon systems through economy of scale procurements. Dwindling budgets emphasize the importance of well coordinated and effective international operations in acquisition programs.

Through the FMS process, we have eliminated the current eight month production gap between the AH-64A and AH-64D. Originally, our gap was 19 months with an estimated cost of \$300 million to the U.S. taxpayer. We have successfully closed these gaps by aggressively working FMS cases with Egypt, Kuwait, Netherlands, and the United Kingdom. Combined potential sales represent over \$4 billion worth of business to the U.S. industrial base while reducing the US Longbow Apache acquisition costs by up to 10%.

In summary, we are moving in a new area for U.S. Army acquisition programs. Security assistance now directly affects key elements of a U.S. Army developmental program.

The Longbow program completed a significant milestone 5 October 1994. The Conventional Systems Committee (CSC) approved the expenditure of funds for long lead contracts for the Aircraft and Fire Control Radar. The key to this decision was the hard work of the government/contractor team that has produced outstanding results.

MDHS has trained two groups of pilots in the Longbow Prototype Aircraft. The first, a group of eight officers and civilians from the Army Aviation Technical Test Center (ATTC) at Ft. Rucker, are currently conducting Preproduction Qualification Testing (PPQT) with the Joint

Venture (manufacturer of the FCR) and the MDHS test pilots at Yuma Proving Ground (YPG), AZ. This testing constitutes Combined Technical Testing (CTT) which maximizes the utilization of scarce resources and gets the government the best return on the dollar. The testing is expected to continue through mid November 1994 at YPG and Eglin Air Force Base (AFB), FL.

During this effort, all modes of operation of the FCR are being rigorously exercised in the desert environment and in the presence of multiple countermeasures. The tactical modes of the radar include the Ground Targeting Mode (GTM), which is the principle targeting mode for ground and air targets, the Air Targeting Mode (ATM), which provides an air overwatch and air targeting capability, and the Terrain Profile Mode (TPM) which provides the pilot with terrain elevation and obstacle information to aid in pilotage during adverse weather.

The FCR is being tested against targets in environments from benign conditions to multiple application of both active and passive countermeasures. This stringent test will define the limits of the systems' capability to detect, classify, and prioritize targets in the most difficult of simulated combat conditions prior to entering into Initial Operational Test and Evaluation (IOTE).

CPT Paul Riest's aviators and

maintenance personnel (A Co., 2nd Battalion, 229th Aviation Regiment) were the second group to complete training in the Longbow Prototype Aircraft. Upon completion of this training on 3 October 1994, CPT Riest's unit began deploying to Ft. Hunter Liggett, CA for the Force Development Test and Experimentation (FDTE).

Another exciting aspect of the program was tested in September, when the Longbow passed 78 targets in a digital databurst to the A2C2 Black Hawk which was in Arizona for testing. The Longbow passed five messages to the Black Hawk using two different protocols, both TAC-FIRE, and the Air Force Advanced Protocol Development (AFAPD), a precursor to the Army Standard, now in development.

The messages were passed over the SINGARS radio using the tri-service Improved Data Modem (IDM). This demo marks the first time two different Army aircraft have passed graphic data. In a late September test the Longbow passed and received digital message information over 100NM to the USAF JSTARS E-8B via the UHF-AM secure radio and the IDM. This is an exciting development for the future Force XXI.

Maintainers have had great success as well, completing the Logistics demonstration between March and June this year. One of the many high points occurred in June 1994 when

the Army maintenance team converted a Longbow Aircraft without Fire Control Radar to a fully operational "Radar bird" in four hours, (half of the Army's required time of eight hours). This included changing out two 701C engines which are part of the Fire Control Radar mission kit, replacing the 701s. This demonstration proved out the requirement for a common aircraft configuration, which gives the field commander unprecedented flexibility to swap out radars and engines as required and maintain maximum combat capability.

As of this writing, nine fire and forget missiles have been successfully launched from the Longbow Aircraft at Eglin Air Force Base.

Following completion of PPQT at YPG and Eglin AFB and the FDTE at Ft. Hunter Liggett, the stage is set for Operational Testing (OT).

The OT is divided into two phases. The first, a gunnery phase at China Lake Naval Weapons Test Center, will match Longbow against its predecessor the AH-64A to compare the effectiveness of the systems in an environment designed to blind laser guided munitions weapons. Phase two is a Force-on-Force test at Hunter Liggett, where the six Longbow Prototypes will go head-to-head with a Motorized Rifle Battalion (reinforced) in

a high threat air defense environment. Lastly, the Longbow aircraft will complete a transportability demonstration during March where the six prototypes will load into a C-5B. A successful OT will provide the key vote in the November 95 Defense Acquisition Board (DAB) which will authorize PEO Aviation to begin Longbow production.

It is significant to note that the Longbow Prototype aircraft have logged more than 2500 flight hours since the first flight in 1992, maintaining an impressive 86% availability rate and 92% launch rate in support of flight testing.

Stay tuned. Good things continue to happen on the AAH Program, and nothing succeeds like success!

As you can see, the new Apache Attack Helicopter organization is managing a multifaceted program. We have delivered a combat proven Apache A helicopter to the U.S. Army and are preparing to deliver that same aircraft to our allies. We will soon start production of the Longbow aircraft which will lead the Army into the digital battlefields of the future.

★★

LTC Thomas is the Product Manager, Apache Modernization, St. Louis, MO.

LTC Gunning is the Product Manager, Longbow Apache, St. Louis, MO.

SOA: FROM AIRCRAFT FIELDING TO OFFICE TRANSITION

The Special Operations Aircraft PMO begins winding down its efforts after accomplishing its mission.

I'm filled with pride at what this team has accomplished over the years yet this is indeed a bittersweet moment in the history of this office. Bitter because we're breaking up a very successful team of government and contractor personnel — sweet because the reason for the breakup is that we've almost completed the successful fielding of the aircraft.

We've fielded 21 MH-60Ks (one to go) and 15 MH-47Es (10 to go). Aviator training began in early June and we expect our customer, the 160th Special Operations Aviation Regiment (SOAR), to be through initial training by April 1995.

On a personal note, I find the transition of the office particularly poignant having been involved with the program since its inception at the

Leesburg, VA conference on SOA in October 1984.

The SOA Product Manager's Office will transition during the 2nd Quarter 1995 following completion of the 160th SOAR Mission Training phase. The mission of sustaining the fleet of 60Ks

and 47Es as well as incorporating future modifications will then be the responsibility of the Technology Applications Program Office (TAPO), here in St. Louis.

There are many lessons to be gleaned from this program, however space constrains me to name only the most important.

Software: Unrealistic Expectations — Beware the smiling software salesman who is very positive about integrating his product.

In 1986 when IBM was competing

for the software integration contract, they maintained we only needed to add 14,400 lines of software code to the existing Nighthawk software to get a good product. Well, over 4,500 software trouble reports (STR) and 300,000 lines of code later, we have a good load of software!!

Specifications: Must be precisely defined. Our Prime Item Development Specification (PIDS) was vague which resulted in misinterpretation of requirements between the contractors and government. This in turn led to many of the software problems noted above. Ensure the PIDS is detailed enough for complete understanding among all parties.

Success: Clearly define what success means and get all (user/contractor/Government) to sign in blood!! For SOA, success was defined as passing the Government Acceptance Test Procedure (GATP). The GATP was broken up into functionality areas (153 it turned out). Any STR falling into one of these areas had to be fixed. This was later refined to: any STR which, if not fixed, resulted in 1) not passing the GATP, 2) Safety problem, 3) Regression, had to be fixed. To see progress, milestone the success plan.

User: You must define who the user representative is and ensure the entire community agrees. With SOA, the user was obvious — the 160th SOAR. It may not be quite so obvious with other programs. It will do no good to incorporate

“great ideas” into your software, etc. from a user that you later discover is not representative. The rework will be fatal as you continually react to the “new” user changes. With SOA, the user was a key member of our team. He was involved throughout the life cycle, from cockpit configuration to minute software changes. When it came time to accept the aircraft, there were no surprises because the 160th was instrumental in the aircraft’s design and production.

Simulator: Once you’re clear on who the user is, keep him in the loop. If your program has a simulator, use it and your software/avionics benches to lock in software changes. *Absolutely* ensure the user and contractor agree with the changes when viewing the simulator before doing the software engineering order. Get the software fixes approved via the simulator. It is much cheaper to fix software, et. al. early.

Teamwork: By far, the most important lesson learned was to form a team, focused on success. The purpose of the team is threefold:

- define the program’s critical processes;
- decide if these processes are broken or are as efficient as possible;
- input solutions to fix the problem or increase the efficiency.

The team consists of three levels: An Executive Steering Group (key

industry and military leaders who interact with the program), a Management Work Group (decision makers in all agencies who affect this program), and Process Action Teams (chartered by the MWG to accomplish specific tasks). To date, we have chartered ten PATs (Software, Aircraft Survivability Equipment, Multi-mode Radar, Electro-environmental Effects, Data Collection, Training, Combat Mission Simulators, Testing, Financial, and Materiel Changes).

The MWG evaluates issues and decides if an issue's significance is enough to assign a PAT to it. If so, a PAT is formed and chartered to fix the process problem. The PAT contains members of organizations who, in many cases, previously graded us at the end of a process (evaluated our program and gave us a go or no go). Now these "paper graders" are with us on the team and helping us "write the paper".

The PAT receives guidance from the MWG. The MWG, in turn, receives guidance from the ESG which can also be used to resolve those few disputes not adjudicated at the MWG level. By taking the risk of totally opening up to the world the program's problems and getting the right folks working on them, you make the problem the team's problem, not just the program manager's problem. Once these problems are recognized and PATs assigned, you then have ownership and accountability. That's why it is critical to get all key "paper

graders" on the team. This concept works. The fact that what were deemed insurmountable problems were resolved by this team, leading to the successful fielding of the world's most sophisticated helicopters, is proof positive that teamwork WORKS!

As a final note I want to thank all members of TEAM SOA whose hard work has resulted in the success this program has enjoyed to date.

★ ★

LTC Rogers is the Product Manager, Special Operations Aircraft, St. Louis, MO.

COMANCHE (continued from page 22)

practices where possible. More simulation activity was planned to reduce the extensive and more expensive flight test program. Other concepts included a reduction of Government oversight, acceptance of all data submittals in contractor format and use of contractor-supplied logistics support during the first few years of fielding.

We've also submitted a number of waiver requests to seek relief from the requirements of certain Army and DoD regulations that add expense to the program.

Weapon system development remains a monumental task, but with the talent and determination of our dedicated work force, we will ensure that our soldiers have the means to meet the operational and warfighting challenges of the future.

★ ★

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FORCE XXI (continued from page 10)

One stellar success story for acquisition reform is the TH-67 Creek helicopter. Thirty-two aircraft were delivered within one year of the contract award with the first one seven months ahead of schedule and saving \$30 million. The first class to train with the aircraft started six months after initial delivery and its students outperformed previous classes while saving \$300 per hour in operational and support costs. All of this was based on strict adherence to the principles of acquisition reform.

The Comanche program is and

must continue to meet the same standards. It is and must continue to justify its existence in part as an Acquisition Reform Carrier for the future, just as it is a Technology Carrier for the future.

Clearly, I am preaching to the choir: The American people must be told the story of Comanche and the Army's critical need for it in all the missions of Force XXI. Together, we can show them the need to protect their ground forces with high technology — the RAH-66 Comanche.

★★

Mr. Decker is the Assistant Secretary of the Army for Research, Development, and Acquisition, Washington, D.C.

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Ms. Diane J. Mack
PV1 Kelly L. Oakes
PFC Alan A. Porsky
LTC Darrell L. Roll
PV2 Jennifer M. Sayers
1SG Nathaniel Scott
PV1 Christopher R. Shonk
PV1 Kyle D. Strickman
PV2 Jonathan W. Tuttle
PV1 Christopher D. Wolfe

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CPT David N. Gereski
Mr. Bruce A. Goodale
Mr. Gary R. Howland
Mr. Russell A. Kimes
Ms. C. Rande Vaux
Mr. Dave Zvednick

**CORPUS CHRISTI CHAPTER
CORPUS CHRISTI, TX**

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Ms. Beverly A. Huls

**DELAWARE VALLEY CHAPTER
PHILADELPHIA, PA**

Cadet David A. Albright
Ms. Sandi L. Busch
Mr. Michael Eastman

**EDWIN A. LINK MEMORIAL
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Mr. Martin Langley

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MAJ Douglas M. Taylor

**GREATER CHICAGO AREA
CHAPTER
CHICAGO, IL**

CW2 August C. Hohl
PV1 Daniel Lyle Peterson

**HUDSON-MOHAWK CHAPTER
ALBANY, NY**

LTC(P) William R. Maloney

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INDIANTOWN GAP, PA**

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CPT Daniel R. Stefanowich
CPL Todd F. Smith

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Mr. William E. Baker
CW3 Ron H. Barloon
CW2 Anthony C. Congelosi
2LT Darren Michael Flowers
MAJ Timothy C. Gorrell
SSG Becky L. Johnson
CW2 Ronald S. Mallhot
CW2 Steven R. Magliocco
CW2 Dale W. Miller
CW2 Helaine Moesner
CSM Jack L. Tiley
CW2 Gerhard P. Turner
CPT Scott T. Waggoner
MAJ James A. Willet

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CW2 David A. Culler
CW2 James William Eldreth
SPC Janet L. H. Smith

**JACK H. DIBRELL (ALAMO)
FORT SAM HOUSTON, TX**

MAJ Michael Dennis Grady, Ret
CW3 Richard R. Schwartzberg

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FORT LEAVENWORTH, KS**

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1LT Matthew S. Furlong
CW2 Nikolas B. Kubli
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CPT Phillip A. Pedersen
CW5 William D. Sorenson
1LT Allen H. Stephen

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FORT RICHARDSON, AK**

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 FAIRBANKS AK**

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 FORT BLISS, TX
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 SPC Eric J. Book
 MSG Dorothy L. Buck
 SFC Doug Easterday
 LTC George J. Gluski
 SSG Linda S. Schwartz
 CW4 Greg D. Smith
 SSG Daniel J. Snyder

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 MAJ Mitchell P. Danner
 CW3 Conrad E. Edwards
 CW3 Philip F. English, Ret.
 CW4 Levi James Hebert, Ret.
 CW4 Ronald G. Ingram
 CSM David R. Keyser
 COL Gerald P. Kokenes, Ret.
 CW2 Gary C. Lavers
 CPT Ronald R. McConnell
 1SG Jesus M. Perez, Ret.
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 CW2 Jeffrey J. Fitzgerald
 LT1 Alfred N. Franco
 MAJ David S. Long
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 CW2 Richard E. Peterson
 CPT William T. Wadsworth

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 MAJ Theodore A. Mickewolus
 MSG Joseph D. Reilien

**RAGIN' CAJUN CHAPTER
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CW3 Raymond W. Butler
 SFC Juan Cordero Rosado

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CW2 Charles H. Nesbit
**SOUTHERN CALIFORNIA
 CHAPTER
 LOS ANGELES, CA**
 Mr. John O'Connor
 Mr. Mark C. Radeleff

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 CW3 Dexter K. Churn
 CW2 Sean F. Gilpin
 PV2 Jefferson R. Kreman
 CW2 William D. Mulkins
 CPT Matthew D. Palsen
 SPC Adnan Rivera
 SPC Douglas J. Swais
 PFC Anthony W. Taddiken
 LTC Gregory D. Walker

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 RALEIGH, NC**

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 SFC Harry D. Jewell
 CW4 Terry L. Rippy

**TALUINUS CHAPTER
 WIESBADEN, GERMANY**

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 CPT Ethan T. Crist
 SGT Gregory J. McCroan
 LTC Johnny L. West

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 WASHINGTON, DC**

Mr. Robert L. Burdett
 CW3 Charle W. Deltierick
 CW2 Jess Dunn
 CW4 Don J. Everhart
 Ms. Mary M. Frederick
 Ms. Karen J. Gant
 1SG Carol L. Guthrie
 CW3 Joseph W. Johnson, Jr.
 CW3 Terrance L. Lapp
 CW2 Christopher S. Lowe
 CWO Kevin L. Magee
 CW4 Michael S. Olin
 SSG Matt T. Rogers

**WINGS OF THE MARNE
 CHAPTER
 ANSBACH, GERMANY**

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 CPT Steven G. Millward
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 CHAPTER AFFILIATION**

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 Mr. Thomas F. Bashara
 CDT Christopher T. Brady
 CDT Burke L. Bristolow
 Mr. Eric Cotele
 Cadet Robert M. Detrick
 SGT Mark Stanley Estabrook
 Mr. Gene F. Freeman
 Mr. Dan Gauger
 CWO Walt Gould
 Cadet Randall E. Hagefelt
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 Mr. Jim Hockenberry
 CDT Jason L. Hoge
 CDT Peter A. Hurd
 Mr. L. Starford Johnson
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 CDT Charles F. Moehlenbrock
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 Cadet Dana T. Sander
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 PV1 Margaret K. Wallek
 Ms. Mary Ann West
 Cadet Kevin L. Winters
 Mr. Leslie J. Ziegler
 SSG Norman W. Zelke

Top Chapters

The 1 November 1994 Membership Enrollment Competition standings have the following chapters ahead with two months left in the CY94 contest ending 31 December. The rankings are based on **CY94 net membership gain.**

Master Chapters (175 or more members)	Senior Chapters (85-174 members)	AAAA Chapters (25-84 members)
1. Aviation Center...512	1. Iron Eagle.....86	1. Black Knights.....16
2. Colonial Virginia...102	2. Greater Chicago....26	2. Tarheel.....16
3. Washington DC.....55	3. Pikes Peak.....14	3. Rochester.....12

Top Guns as of 1 November 1994

The member who sponsors the greatest number of new members during the contest year ending 31 December 1994 wins an all expense-paid trip to the AAAA Annual Convention, as well as a \$300 cash award, and receives a plaque.

CW3 Eddie L. Sullivan.....	185
CPT H. Michael Brinkman.....	77
1SG Luther D. Kibler.....	75
CW2 Brett J. Armstrong.....	45
CPT James L. Jacobson.....	44

**New AAAA
Chapter Officers**

Air Assault:

MAJ Jeffrey W. Humphrey (Secy).

Arizona:

Elton T. Gordon, Jr. (Pres); James W. Wasson (Treas); James C. Schoene (VP, Memb); T. Dave Olney (VP, Indus. Aff); COL David F. Sale, Ret. (VP, Prog); MAJ Hugh M. Dimmery, Ret., CW3 Robert M. Kelly, Ret., Robert Codney (Members-at-Large).

Aviation Center:

CW3 Joel Speller (VP, Prog); COL Glenn W. Mitchell (Aeromedical).

Central American:

CW4 Luis Zamudio (Pres); MAJ Duane Carlton (Treas); CW4 James Helton (VP, Memb); SGM Johnny Zornes (VP, NCO Affairs).

Colonial Virginia:

CW4 Danny F. Moore (VP, Warrant Officer Affairs).

Old Tucson:

MAJ David A. Mitchell III (Pres); SSG Brian S. Zimmerman (Treasurer).

Phantom Corps:

COL Richard A. Cody, LTC Michael J. Gaffney, COL Craig D. Hackett, COL Craig H. Pearson, COL Douglas I. Smith, Jr. (all SrVPs); MAJ Cary A. Hilton, Jr. (Secy); CW5 Ronald W. Gerner (VP, Memb); CW4 Jeffrey A. Harford (VP, Prog); CW4 Reid D. Feltmate (VP, Pub); CPT(P) Robin D. Lynch (Exec. VP, Opns); LTC Ralph Shaw, Ret. (VP, Civilian Affairs).

Pikes Peak:

MAJ Earl C. Myers, II (VP, Memb); 1LT Quint A. Consani (VP, Awards).



Above: COL Gerald L. Crews (right), Warrant Officer Division Chief, U.S. Total Army Personnel Command, presents CW5 David A. Prewitt (left) with the Bronze Order of St. Michael Award at Mr. Prewitt's farewell ceremony on 23 March 1994. Mr. Prewitt departed the Warrant Officer Division for assignment as the Aviation Safety Officer, U.S. Special Operations Command, MacDill AFB, FL.

Below: On 11 August 1994, MG Dewitt T. Irby, Jr. (left), Program Executive Officer, Aviation, presented an Order of St. Michael Bronze Award to LTC Michael W. Rogers (center), Special Operations Aircraft Product Manager in acknowledgement of his leadership in managing the testing, production, and fielding of the MH-47E and MH-60K. Looking on is LTC Rogers' wife, Patricia.



LTC HORACE G. COOKE, RET.

LTC Horace G. Cooke, Ret., 84, a Charter Life Member of AAAA, of 4581 Ravensworth Road, Annandale, VA, died on 14 July. He was born in Goldthwaite, TX 29 May 1910, and joined the Army in 1942, fighting in WWII and Korea.

LTC Cooke was one of the two original parents of the Army's Airmobile concept when, at Ft. Rucker, COL Jay Vanderpool and he initiated and carried to a successful conclusion PROJECT ABLE-BUSTER in which they armed light fixed-wing and helicopter aircraft. They followed this start with the development of organizational tactics and technique data for the airmobile concept, of which many claim fatherhood for this concept.

LTC Cooke held many varied assignments with the Army, from superintendent of schools for the United States Forces in Austria, when the CG discovered that he came into the Army from a position of school principal, to flying spies out of Vienna to the safe side of the "Iron Curtain". As new LTs on their first assignment, LT Earl Montgomery and he put their "Cub" together from the crate in which it was delivered; on their first cross-country, they got into the clouds and pancaked the aircraft into the side of a mountain. Neither received a scratch.

LTC Cooke retired in 1963 and joined Boeing-Vertol as one of their Washington representatives. He was a Past President of AAAA's Washington, D.C. Chapter and was a member of the Cub Club.

LTC Cooke is survived by his wife, Winifred; son Michael, from Tampa, FL; daughter Susan Maroheski, of Elkton, MD; grandsons Christofer and Benjamin and granddaughter Army Maroheski; sister Nell Weaver, and brother Herbert Cooke of Goldthwaite, TX.

AAAA CALENDAR

A list of upcoming AAAA Chapter and National dates.

January, 1995

- ✓ **Jan. 10.** AAAA National Executive Board Meeting, Ft. Rucker, AL.
- ✓ **Jan. 11.** AAAA Aviation Trainer of the Year Award Presentation, AAAA Air/Sea Rescue Award Presentation, AAAA Aviation Fixed Wing Unit Award Presentation, AAAA Aviation Medicine Award Presentation, & AAAA ROTC Award Presentation, Ft. Rucker, AL.
- ✓ **Jan. 27.** AAAA Scholarship Board of Governors Executive Committee Meeting, Best Western, Arlington, VA.
- ✓ **Jan. 28.** AAAA National

Awards Committee Meeting to select CY94 National Award winners.

February, 1995

- ✓ **Feb. 1-3.** 21st Annual Joseph P. Cribbins Product Support Symposium, sponsored by the AAAA Lindbergh Chapter, Stouffer Concourse Hotel, St. Louis, MO.
- ✓ **Feb. 2.** AAAA Outstanding Avn Logistics Support Unit of the Year & AAAA Industry Award Presentations, Stouffer Concourse Hotel, St. Louis, MO.

March-April, 1995

- ✓ **Mar. 29-Apr. 2.** AAAA Annual Convention, Georgia World Congress Center, Atlanta, GA.

New AAAA Chapter Officers (cont.)

Potomac:

LTC Robert E. Godwin (SrVP); COL Robert A. Wagg, Jr., Ret. (Treasurer).

Rhine Valley:

MAJ Cynthia A. Crowell (Senior Vice President).

Taunus:

CPT Ruth M. Rymal (Treas).

Wings of the Warriors:

MAJ Richard W. Lally (SrVP); CW2 Michael J. Bess (Treasurer).

Aces

The Following Members Have Been Designated Aces in Recognition of Their Signing Up Five New Members Each.

CPT John R. Cunningham

CW2 Joseph P. Elliot

LTC Bruce K. Ladeira

CPT William M. McGuire

CPT Deborah L. Snyder

MAJ George H.

Rhyndance, IV

Ms. Catherine C. Roache

New AAAA

Life Members

GOL Ramon A. Ivey

SFC James L. Watson

GOL Steve J. Snow

Honorary Member

The following person has been selected by his Chapter as an Honorary Member. He will receive a complimentary one year membership, citation in these pages, and a "Certificate of Honorary Membership".

BG Frank A. Avallone
Connecticut Chapter

The AAAA Joseph P. Cribbins Product Support Symposium/ ATCOM Advance Planning Briefing to Industry

The 21st Annual Joseph P. Cribbins Product Support Symposium, sponsored by the AAAA Lindbergh Chapter, will be held in St. Louis at the Stouffer Concourse Hotel at the airport on 1-3 February 1995. The symposium is also an ATCOM Advance Planning Briefing to Industry (APBI) where business opportunities will be covered in briefings by personnel in ATCOM and the Program Executive Office (PEO), Aviation. The symposium is designed to address the issues desired by industry attendees and to allow for government-industry exchange of ideas. An outstanding lineup of speakers has been arranged.

The symposium theme this year reflects the changing nature of Army Aviation and a re-look at how the Army and Industry Aviation communities will continue to do business with significant downsizing and major budget decrements. The Army Aviation community must remain dedicated

to its evolving Aviation Modernization Plan as well as continued sustainment of the existing fleet.

In addition to plans for new business opportunities, the implications of the Army's evolution to electronically integrated systems and their relationship with the total Army's Digitization of the Battlefield initiatives will be discussed. Another topic will be added emphasis on Foreign Military Sales (FMS) and sustainment of the industrial base through changes in the system development process, as well as streamlining and re-engineering manufacturing. DoD acquisition reform is another topic which will be addressed.

The Lindbergh Chapter, ATCOM and the PEO, Aviation believe that an interesting and informative program has been developed. Your early registration and attendance are encouraged.

WEDNESDAY, 1 FEBRUARY 1995

- 1500-1900 Registration and Ticket Sales
1700-1900 Early Bird Reception

THURSDAY, 2 FEBRUARY 1995

- 0700-1600 Registration and Ticket Sales
0700-0800 Continental Breakfast

MORNING SESSION

- 0800-0815 Opening Remarks
MG Dewitt T. Irby, Jr.
President, Lindbergh Chapter
- 0815-0900 Government Keynote Speaker
Hon. Gilbert F. Decker,
Asst. Secretary of the Army
RD&A
- 0900-0945 Industry Keynote Speaker
C.G. King, President, Boeing
Defense & Space Group
- 0945-1015 Break
- 1015-1115 Guest Speaker
Colleen A. Preston, Deputy
Under Secretary of Defense
for Acquisition Reform

LUNCH

- 1130-1330 Luncheon with Speaker
LTG John J. Coburn, Deputy
Commanding General
Army Materiel Command

AFTERNOON SESSION

- 1330-1445 ATCOM Briefings
1445-1515 Break
1515-1600 ATCOM Briefings
1600-1630 Q&A Session

EVENING SESSION

- 1830-1930 Reception
1930-2045 Dinner
2045-2200 Awards Presentation
and Guest Speaker

FRIDAY, 3 FEBRUARY 1995

- 0700-0800 Continental Breakfast
0800-0915 PEO Aviation Briefings
0915-0945 Break
0945-1130 PEO Aviation Briefings
1130-1200 Q&A Session
1200-1215 Closing Remarks
MG Dewitt T. Irby, Jr.



**1995 AAAA Joseph P. Cribbins
Annual Product Support Symposium/
ATCOM Advance Planning Briefing for Industry
Advance Registration Form**



STOFFER CONCOURSE HOTEL — ST. LOUIS, MO — 1-3 FEBRUARY 1995

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