Special Focus: Product Support and Maintenance

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ARMY AVIATION

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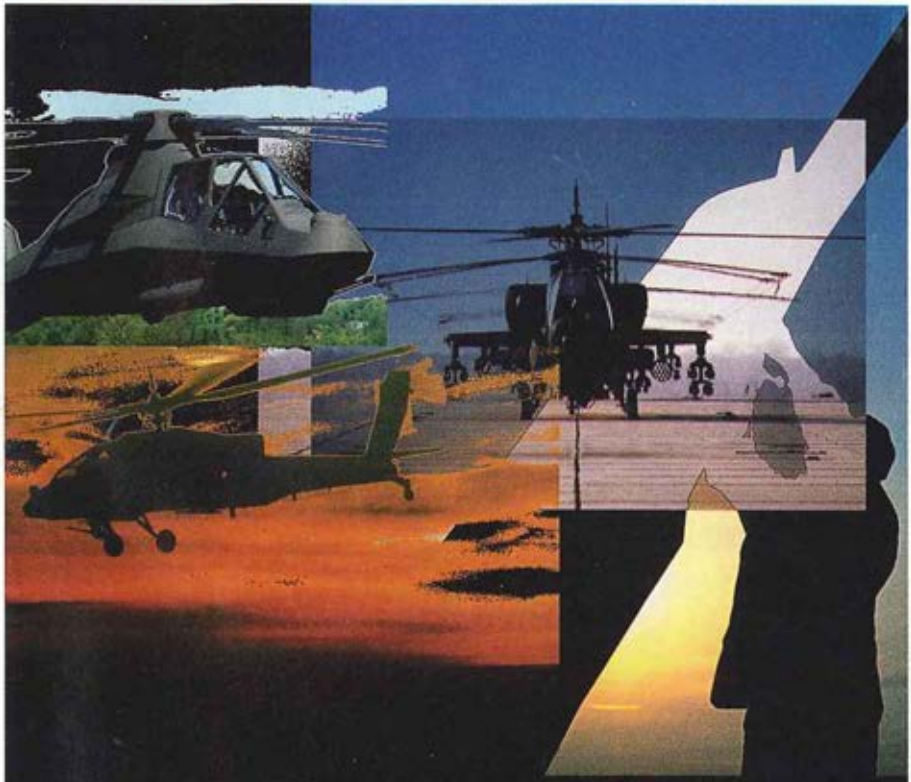

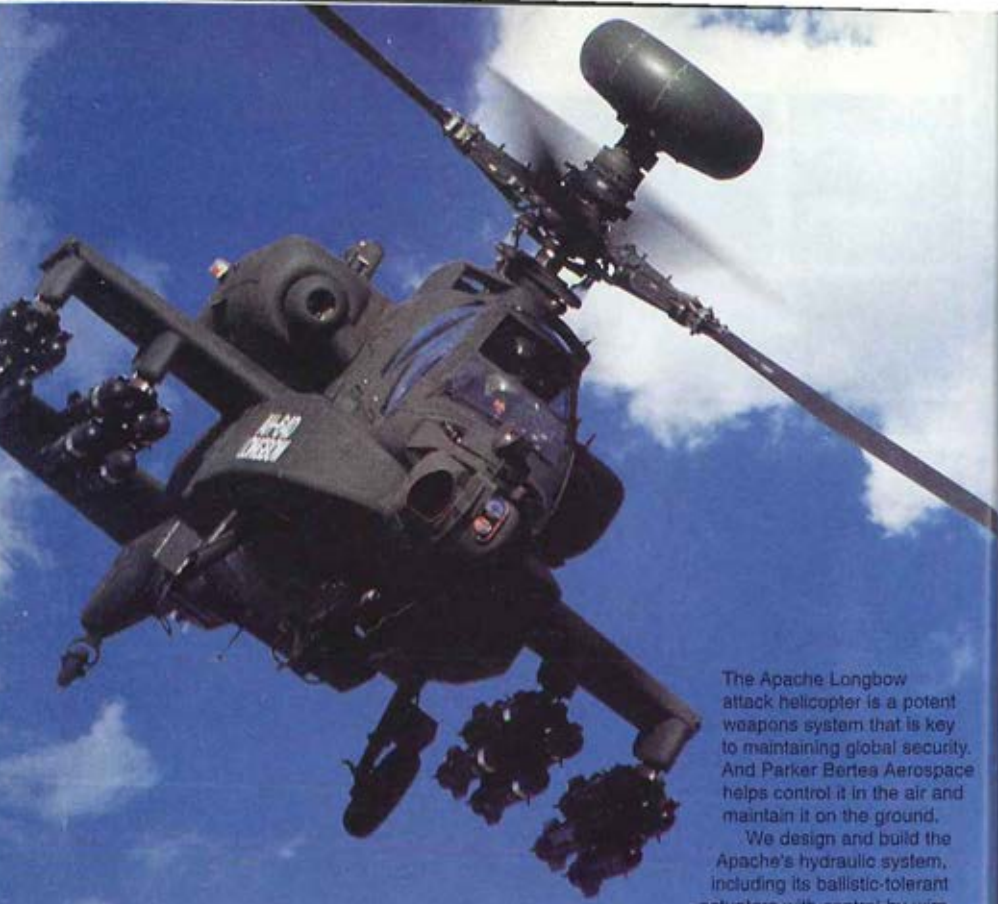

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PUBLISHER
Lynn Coakley

EDITOR
William R. Harris, Jr.

ASSOCIATE EDITOR
Stephen Moore

CIRCULATION MANAGER
Jill Thomas

CIRCULATION ASSISTANTS
Mary Ann Stirling, Debbie Coley, Deb Simons, Mary Ellen Kother

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FORTHCOMING ISSUES

February 1996 — Special Focus: Force XXI.

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Briefings

The U.S. Army's **RAH-66 Comanche** prototype lifted off for the first time on 4 January 1996 at Sikorsky's West Palm Beach Development Flight Test Center. The Comanche, developed by the **Boeing Sikorsky RAH-66 Comanche Team**, took off at 1:06 p.m. for a flight which lasted more than an hour. During the flight, the test pilots carried out a number of maneuvers, including hover, left and right hover turns, and forward flight. The Comanche prototype will be put through a series of flight tests in 1996 designed to develop the helicopter's full flight capabilities. In a process known as "opening the envelope," the aircraft will be flown faster and maneuvered more aggressively in the weeks and months ahead.

On 5 December 1995, **Webb F. Joiner** was named chairman of **Bell Helicopter Textron**, Ft. Worth, TX. **Lloyd Shoppa** was named president, succeeding Mr. Joiner. Mr. Joiner joined Bell in 1960 and held several financial management positions prior to becoming executive vice president in 1986 and president in 1991. He is chairman of the American Helicopter Society and a board member of several educational and charitable institutions. He is the fourth chairman in Bell's history. Mr. Shoppa is the sixth president of Bell. He joined the division in 1964, and has held a number of positions of increasing responsibility. He served as president of Bell Helicopter Textron Canada from 1990-1992.

McDonnell Douglas Helicopter Systems (MDHS), Mesa, AZ was awarded initial funding for the first 18 remanufactured AH-64D Longbow Apaches on 14 December 1995. The $279.6M contract officially activated the AH-64D's production phase, with initial deliveries beginning in March 1997. MDHS will also train pilots and maintainers for the first equipped unit, incorporate integrated electronic technical manuals, first article testing of the production aircraft, initial spares, and a variety of program support of the first production lot.

The U.S. Army has issued a requirement to add a Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) to its **Airborne Reconnaissance Low (ARL)** surveillance aircraft to offset the retirement of aging OV-1 Mohawks. The Army wants to add the SAR/MTI capability by early 1996 and deploy ARL aircraft — modified DeHavilland DHC-7 commuter airliners — to South Korea to take over the OV-1's mission. ARL prime contractor is **California Microwave.**

Westinghouse Electric Corporation, Pittsburg, PA announced on 3 January 1996 that it has signed a definitive agreement to sell its defense and electronic system business to **Northrop Grumman Corporation**. The sale is expected to close during the first quarter following normal government reviews. Westinghouse will retain several smaller commercial electronic businesses, including those serving residential security and telecommunications markets.

THERE'S A REVOLUTIONARY FORCE IN THE AIR.

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RAH-66 COMANCHE TEAM

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1996 ARMY AVIATION YEARBOOK

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AEROSPACE

■ GUEST EDITORIAL BY GEN J.H. BINFORD PEAY III

TRIUMPHANT FLIGHT: ARMY AVIATION IN THE CENTRAL REGION

General George S. Patton once declared that you should never attack where the enemy expects you to come. Attack weakness. Hold the enemy by the nose and kick him in the pants.

In his own pithy way, Patton was recounting the much talked about and coveted indirect approach in battle. Hannibal's maneuver at Cannae, Napoleon's triumph at Austerlitz, Lee's surprise at Chancellorsville, MacArthur's gamble at Inchon, and Schwarzkopf's "Hail Mary" offensive all reflected the Great Captain's drive to gain military victory quickly, decisively, and at least cost by doing the unexpected.

Army Aviation is the key to the indirect approach in battle.

Advances in military technology during the last half century have raised this concept to new heights, accelerating changes in weaponry and doctrine that pose both opportunities and mind-boggling challenges for the American military. Nowhere is this more evident than in the maturation of Army Aviation. We have seen it evolve from aerial observer for the artillery during World War II, air ambulance during the Korean War, and troop transporter in Vietnam to become a lethal weapon of maneuver and destruction during DESERT STORM. This transformation has not escaped the attention of the United States Central Command, where the capabilities of Army aviation are being embedded in operational plans.

Such capabilities have become increasingly important as the U.S. armed forces redirect their energies away from the familiar Soviet dominated landscape of the Cold War toward the less well defined, multi-dimensional demands arising out of ubiquitous regional conflicts. This trend is particularly applicable to the Central Region, a complex collection of 19 nations that stretches from the Horn of Africa and Egypt through Jordan and the Gulf states to Afghanistan and Pakistan and which incorporates the waters of the Red Sea, Gulf of Aden, Gulf of Oman, and the Arabian Gulf.

Maintaining security and stability in this part of the world is essential to the political and economic well-being of

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UNITED TECHNOLOGIES SIKORSKY AIRCRAFT

America and of the entire international community. Some 65% of the world's proven oil reserves are buried beneath the wind-blown sands of the Gulf states — oil that provides the United States with 22% of its needs, Western Europe 43%, and Japan 68%. Most of this oil must transit the narrow straits of Hormuz, as well as the Bab El Mandeb, and the Suez Canal — maritime choke points that can be easily blocked.

In addition to safeguarding the oil that fuels the global economy, the United States also focuses on defending freedom of navigation and access to markets, assuring the safety of U.S. citizens and property abroad, and promoting the security of friendly states within a comprehensive Middle East peace framework. Other interests include promoting respect for human rights and democratization, providing humanitarian assistance, and countering drug traffickers. We also seek to foster economic development, prevent the proliferation of weapons of mass destruction, and defeat international terrorism.

Safeguarding these vital and enduring interests is a formidable task. USCENTCOM must undertake policies and operations in a diverse region, rich in culture, but plagued by endemic hostilities. The birthplace of Judaism, Christianity, and Islam, the Central Region is home to 427 million people from 17 different ethnic groups and 420 major tribal groupings. Such multi-culturalism is combined with border disputes, competition for resources, radical political and religious movements, economic strains, and exploding populations to provide fertile ground for both internal and external conflicts. Aggravating these sources of friction are Iraq and Iran, the gravest national threats to regional peace and stability. Both seek dominance in the Gulf and have frequently attempted to intimidate their weaker neighbors.

After losing more than half of its conventional military strength in the Gulf War, Iraq is overcoming crippling international economic sanctions and intrusive United Nations inspections to maintain the largest collection of ground forces in the region. Furthermore, as it did during its invasion and subsequent occupation of Kuwait in 1990, Iraq repeatedly demonstrates the capability to mobilize rapidly and to move large troop formations quickly to threaten Kuwait and Saudi Arabia.

While Iraq remains the near-term challenge, Iran is the long term threat. Fifteen years after seizing power, Iran's revolutionary regime continues its quest to dominate the Gulf and to become the spiritual leader of the Islamic world. With its vast oil reserves, many engineers and technicians, and large population, Iran has been able to overcome internal unrest and economic malaise to pursue its ambitions. It has purchased submarines, attack aircraft, and anti-ship missiles while underwriting Islamic extremists worldwide, militarizing disputed islands in the Strait of Hormuz, and seeking to disrupt the peace process.

These threats are inflamed by the proliferation of weapons of mass destruction. Iraq and Iran have joined several other states worldwide trying to acquire ballistic and cruise missiles and chemical, biological, and nuclear weapons. The difficulty of their quest is made easier by the willingness of nations such as Russia and other former Soviet republics, North Korea, and China to sell

(TRIUMPHANT — cont. on p. 34)

THE ARNG DIRECTOR'S FAREWELL TO AVIATION

Remarks made to the AAAA Potomac Chapter, 10 October 1995.

I realize it must go down hard to have in your midst a non Army aviator and I appreciate your tolerance of that fact, even though I do hold a civilian instrument rating. However, I offer to you that I began my career 35 years ago as an enlisted aircraft crew chief in the Hawaii Army National Guard. Maybe you will at least tolerate me in this group because of that.

"...we need to... get on with the business of implementing a cost-effective [UH-1] SLEP program..."

I started as a crew chief on L-19 Bird Dogs. I realize most of you red hot turbine aircraft pilots are too young to remember those things; but if you go to the Air and Space Museum you will see one suspended from the ceiling. The truth is, it was a fine aircraft, very forgiving and easy to maintain and very cost effective to operate.

The aviation section I belonged to back then had three aircraft for every pilot assigned at the time. We had one full-time mechanic for every six airplanes we had. He was the mechanic, TI, flight operations NCO and administrator for the unit all in one. There was no such thing as "Additional Flight Training Periods" — for pay at least! There were many additional unpaid flight training periods simply for the love of flying and the innate need to maintain proficiency. Aircrews flew in HBT fatigue uniforms (just like everybody else wore). We had one each OH-13 helicopter, and the pride of the fleet was a U-8D twin Beech airplane that could carry three passengers (if you had less than a full fuel load and carried very little in the way of cargo).

Our safety program revolved around reading a Pilot Information Folder containing something like the *Flight FAX* we have now and whatever accident reports somebody sent to us once in a while with periodic safety briefings (usually before Annual Training). We were looked upon by our ground-pounder brothers as an elite bunch of snobs who belonged to some kind of flying club. (Some things just never change!)

That was the nature of the aviation program I entered a long time ago. Some will call those "the good old days" and in many ways, they were. Others will say

we will never see those days again...and I say, THANK GOD!

By today's standards those were the "Dark Ages" of the aviation program we have today. In the Guard we were fortunate enough to have, at a pivotal time in our history, some visionaries who could see something better for the future of the Army Guard Aviation program. I refer primarily to people like John Stanko who led our program out of those dark ages and saw long ago what could be done and laid the foundation and cleared the path for others to follow to get us where we are today.

I have seen a great transformation in the Army Aviation program in the time I have been privileged to wear this uniform, from the flying club atmosphere I just described to a modern, proficient and capable branch of service that is an extension of the tactical commander's maneuver arm — a branch that has revolutionized warfare and the way it is logistically supported, commanded and controlled.

The Aviation Restructuring Initiative (ARI) is one of the more profound approaches to reconfiguring the aviation structure of the Total Army in a number of years. It comes, I believe, at the same time that changes in the National Military Strategy and severe budget constraints combine to present a challenge to all of us interested in maintaining the leading edge in Army Aviation.

ARI, however, threatens the loss of utility aircraft. I am concerned that our fixation with a "two MRC short war scenario strategy" could find us "behind the power curve," if you will, considering the ambiguity of the new world order. One can easily visualize a situation where we are engaged in those two MRCs simultaneously, and they turn out to be longer in duration, while we are simultaneously committed to a combination of Haitis and Bosnias. This doesn't even begin to address our domestic needs if it all happens at the same time. For these reasons I believe that we need to preserve the utility capacity of Army Aviation in the Army and the Army National Guard and not be so hasty in dismantling what cannot be put together again quickly when it is sorely needed. As a Guardsman, I would be remiss in failing to point out that in every major domestic emergency we have had, the most immediate demand for support is for utility and cargo aviation. We have had two shining examples of late in the Virgin Islands, and in Florida and Alabama with the two recent disastrous hurricanes.

I have a concern that modernization of Army Aviation runs the risk of being slowed significantly as a result of the pressures I just described, but also because of our fascination with the high-tech "Nintendo game culture" that we seem to be developing in our look to the future. Please do not interpret that as a lack of recognition on my part that we must be at the leading edge of high technology. On the contrary, I fully appreciate and support that notion. In fact, I have done all in my power to ensure that we in the Army National Guard stay proactive in that regard. What I am suggesting is that airframe modernization is key to keeping our Army an integral part of a military that ensures we are the only superpower on the planet. Army Aviation is expensive; there is no doubt about that. However, it is a crucial part of keeping our Army at the leading edge and cannot become the bill-payer for every good idea that comes along or every budget scrub.

This is one of the reasons why I believe

(FAREWELL — continued on p. 37)

BY COL DENNIS A. WILLIAMSON
and LTC JAMES P. McGAUGHEY IV

AVIATION LOGISTICS OFFICE

A review of the roles and missions of the DALO-AV.

It has been some time since we reviewed what the DCSLOG's Aviation Logistics Office (DALO-AV) provides to the units and soldiers of Army Aviation.

As a separate Directorate, working directly for the DCSLOG, DALO-AV provides aviation doctrine, policy, and technical expertise needed to maintain visibility and control of the entire spectrum of Aviation logistics. DALO-AV also has the ARSTAFF responsibility to the CSA for all air and ground safety matters that includes providing the Chair for the Army Safety Action Team.

During the past year we have undergone some significant personnel changes: Mr. Wimpy Pybus, recently appointed to the Senior Executive Service (SES), has assumed the duties as the Chief of the Aviation Logistics office. An alumnus of the office (1980-1983), Mr. Pybus replaced COL Bob Hoppes who departed in September 1995 to become Assistant Commandant of the Aviation Logistics School at Fort Eustis. COL Dennis Williamson, the interim chief, will remain in the office.

LTC Jim Budney departed in November to assume command of the 603rd Aviation Support Battalion, 3rd Infantry Division, Ansbach, GE. LTC Gordon Hearnsberger has assumed Jim's duties.

Another imminent loss is LTC Jim McGaughey who will depart in May to take command of the 127th Aviation Support Battalion, 1st Armored Division, Hanau, GE. A replacement for Jim has not yet been designated.

Other personnel assigned to the office include Mrs. Carolyn Chapman (Executive Officer), LTC Dick Ostermann, CW5 Frank Murtagh, CW5 John Lucius, and Ms. Charmaine West (Secretary).

With all of this talent in one location we naturally expect to influence every aspect of aviation supply, maintenance, safety, and readiness. Many more significant areas of responsibility are highlighted on the chart. Obviously, it is our fault if we are bored!

An update on some of the diverse areas we influence are:

Aircraft Retirement Plan. On 14 September 1995, the Vice Chief of Staff, Army approved the Army Aircraft Retirement Plan and requested the MACOM's support in the execution of the plan. The plan provided a comprehensive and focused retirement strategy for 3,000+ aircraft that are excess to Army requirements. We must retire these aircraft by the end of FY 2000 to meet the requirements of ARI, force downsizing, aircraft modernization, and mission migration from the Reserves to the National Guard. The plan's strategy is to minimize readiness impacts, identify and minimize divestiture costs, maximize residual values, and address legitimate industry concerns and safety issues.

Disposition of Excess Flight Safety Critical Aircraft Parts (FSCAP). In Jan 95, the Army co-chaired an OSD/FAA sponsored FSCAP Process Action Team (PAT). The PAT was formed due to concerns with the appropriateness of sales of excess FSCAP and the condition of parts at the time of the sale. The PAT submitted recommendations to OSD/FAA that would allow DOD to identify FSCAP, provide documentation to help in airworthiness determinations, and ensure mutilation of any parts that lacked documentation or were unserviceable. Because of the PAT report, OSD formed an implementation team to begin the revision of policies, regulations and procedures to enable execution of the FSCAP PAT recommendations. We expect the modifications to be completed and implementation to begin 4Q FY96.

Attack Modernization. The Apache fleet is beginning the long remanufacture process from AH-64A to AH-64D Longbow! This office is working closely with ODCSOPS, the acquisition community, and the PM to ensure we field an aircraft that can be supported at a level equal to operational capability.

Army Aviation Safety. In FY95, Aviation completed its safest year on record, a feat which all aviators and maintenance personnel made happen and can take pride in! For our part, safety is a 24-hour business. We are DCSLOG's eyes and ears for aviation safety.

Army Safety Action Team (ASAT). ODCSLOG is the chair of the ASAT. The ASAT, as it applies to aviation, is comprised of members from throughout the aviation logistics, safety, acquisition, and operator communities. No safety critical aviation system issue is submitted to the Army leadership before it is presented to the ASAT for discussion and recommendations. Some issues addressed by the ASAT are the OH-58D tail boom cracks, the AH-64 main rotor head strap pack failures, and the procedures for designating and testing flight safety critical aircraft parts (ongoing).

Aviation Depot Maintenance Programs. As the active Army fleet continues to modernize with the restructuring and downsizing efforts, depot maintenance programs are evolving. The 1996 aircraft and secondary item depot programs will exceed $400M with over a third being performed by contractors. Within the next year contract maintenance organizations will perform nearly all depot maintenance requirements for non-modernized aircraft. Most modernized aircraft (AH-64, CH-47D, UH-60, and OH-58D) depot maintenance will be accomplished by the Corpus Christi Army Depot (CCAD). The two more significant efforts are the UH-60 and CH-47D refurbishment programs being completed at CCAD.

Aviation Readiness Reporting. In April 1995, DALO-AV received approval for a Directed Military Overstrength Chief Warrant Officer (CW5) to conduct

DALO-AV PROJECT

LTC Dick Ostermann	LTC Jim McGaughey	LTC Jim Budney LTC Gordon Hearnsberger	CW5 Frank Murtagh	Carolyn Chapman	Charmaine
FWUAs	CH-47	TH-67 (NTH)	OH-58D	Executive Officer	Secretary
SEMA	SOA Acft	UH-1	AH-64	Security Manager	Receptionist
Non-Std Acft	ICM	UH-60	AH-1	Fed Women's PM	Typist
OSA		OH-58A/C	RAH-66	CFSR/LAR	Correspondence
		OH-6		Office Budget	Files
				History	Suspense
				Internal Controls	O/T Report
				Audit Tracking	Mail
				Personnel Actions	Regulations
				Sp Projects	Travel
				Battle Book	Rosters
				Master Spt Plan (Backup)	Calendar
					Library
AWW Policy	**Budget/ Programmatics Combat Developments Current Operations**	**Readiness (Unit/Systems) Training/ Simulation**	**New Sys Support Safety**		
Retirement Strategy	Avn Restructure Init	Acft Inventory	ASAT		
TAMP/AVCRAD	WW Avn Log Conf	SKD/TMDE	Armament		
A/C Transfers	TAA	Avionics	Missiles		
Drug Enforcement	Facilities	Night Vision Devices	Manprint		
Loans/Leases	War Reserves	WALC (Backup)	AR 95-3/AR-20		
Avn Long Range Plan	MARC	Shelters	Log R & D		
Commissioner of Ofc Revenue (Fines)	ORF	Paint Policy	Readiness Policy		
	Depot Programs	Rules & Mission			
Fly Hour Plan	150	Elec Tech Manuals			
Hand Receipt Holder		Automation POC			
AGSE					
Master Spt Plan					
Fuel					
ATC Eqmpt					
FARP					
Trg Device Spt					
Backup	**Backup**	**Backup**	**Backup**	**Backup**	**Backup**
LTC McGaughey	LTC Hearnsberger	LTC Ostermann	LTC Hearnsberger	CW5 Murtagh	Ms. Chapman

a one year review of aviation reporting policy and procedures. CW5 John Lucius filled the position on 1 SEP 95. The proposed course of action is to rewrite AR700-138, Chapter 3, to bring Aviation Reporting into the electronic age. The recommended change will require units to report aviation readiness electronically using the Logbook Automation System (LAS) 135Z module or other approved databases. The LAS module is currently being fielded within FORSCOM and USARPAC as a temporary automated readiness fix until ULLS-A is fielded.

Digitized Aviation Logistics Systems. Recognizing that we must make better use of digitization technologies, DALO-AV immersed in the process of developing an automated capability that will capture performance, maintenance, and safety data directly from the aircraft. The system must also interface with the Integrated Combat Service Support Standard Army Management Information System to simplify supply and management tracking, diagnostics/prognostics, battlefield simulation, and post mishap investigation. The final DA Mission Need Statement is currently being staffed at HQDA.

Aviation Restructure Initiative (ARI). Aviation is feeling the growing pains associated with aligning under ARI. By the end of FY96 most of the units within V Corps and XVIII Corps will have converted. We would be remiss if we didn't applaud the outstanding work of the ATCOM and PEO-AV Materiel Redistribution Teams. As agents of the DCSLOG, their efforts have been critical to the success achieved in equipping the restructured units. DALO-AV has also been actively supporting the documentation and Integration of the Division Avia-

(DALO-AV — continued on page 38)

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It has come to our attention that there are some people who still believe Lockheed Martin Logistics Management's main experience is maintenance and logistical support for aircraft. And we do support the fixed and rotary wing aircraft of our armed forces throughout the world. But we also perform in exemplary fashion when it comes to wheeled and tracked vehicles. This support includes:

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MAINTENANCE ON THE MOVE — AGAIN!

ATCOM Maintenance Directorate initiatives for 1996.

The ATCOM Maintenance Directorate report for January 1994 talked about all the changes we had just completed. This past calendar year saw the pace of change continuing with the BRAC decision to move/merge ATCOM. To accommodate DFAS and other agencies moving on to the Federal Center, a physical move for most of the Directorate from Building 110 to 102 was just recently completed in December 1995.

Our challenge is obvious — manage all the change while providing uninterrupted support to units and maintainers. Process improvements are ongoing throughout this Directorate, with key emphasis on the use of automation to eliminate paper-bound processing. This update provides a brief summary of those improvements.

Provisioning/Automated Pubs Tracking System. Significant improvements have been made in the processing of DA Form 2028s, Safety of Flight (SOF) messages, ATCOM Engineering Directives (AEDs), and the maximum elimination of paperwork through the use of automation. The Publication Tracking System (PTS) was implemented in October 1994, which allowed on-line processing of the Technical Manual from receipt through publication. All SOF messages are received via E-Mail, with AEDs in hard copy and processing that follows the same procedures used for 2028s.

Records are entered either by E-Mail or hard copy and are tracked, with valuable statistics kept, throughout their life cycle. The PTS provides for automated production of Acknowledgement, Review & Acceptance letters/Publication Change Requests and it searches the database for duplicate changes.

This system has allowed the Provisioning Division to dramatically reduce the number of 2028s outside the Command Standard (45 days) from 61 at implementation in October 1994 to a low of two in September 1995; it also provides an accurate, timely response to the soldier. Resource requirements have been reduced by 15 spaces. This Division is continuing its development efforts with the Maintenance Analysis Checklist in Support of Competition (MACSOC), which will

manage Maintenance & Overhaul packages within the Directorate; MACSOC should be online in April 1996.

Integrated Electronic Technical Manual (IETM) on Compact Disk (CD). In January 1995, we released our first IETM supporting the UH-60 Black Hawk. This Technical Manual (TM) is considered a full "Class III" IETM, which is built around the Joint Computer Aided Acquisition and Logistic Support (CAALS) compliant SGML (Standard Graphic Markup Language) format.

Plans are now finalized for the fielding of other Class III IETMs. We also worked with the Logistics Support Agency (LOGSA) for preparation of Class II IETMs on the remaining ATCOM publications. It is ATCOM's intent to migrate to a higher level IETM wherever the system would benefit.

In September 1995, we witnessed the successful demonstration of supporting software on the Class IV IETM for Longbow. A Class IV IETM is based upon an SGML relational database and fully supports automated troubleshooting. This activity, along with completion of the SGML digitization of the Aviation Depot manuals, established a firm groundwork for a revolution in the way Army Aviation accesses and uses maintenance data.

The goal is not just to improve the publication process but to positively influence O&S costs/readiness.

Modification Work Order (MWO). The mission of this program (Project OLR) is to apply MWOs to all ATCOM managed equipment. Contractor field teams are utilized for this effort. Project OLR for aircraft is a global mission utilizing six fixed sites. This Command's MWO application strategy/priority has been fine-tuned to economize the process and sustain aircraft readiness; the strategy used to achieve this goal is to: modify first to fight first; conserve scarce resources; block application; respond to user/PM requirements.

In May 1995, Project OLR absorbed the Airframe Condition Evaluation (ACE) and Aircraft Analytical Corrosion Evaluation (AACE) mission. This action helps to achieve the above goals and will increase the aircraft's availability to the Commander.

Trained ACE teams are located at each of the six OLR sites with a primary responsibility to perform ACE inspections. This allows tailoring ACE inspections to the owning unit mission priorities and should enhance readiness while accomplishing the ACE requirements at less cost. The ACE is keyed to detect general progressive deterioration of the aircraft regardless of cause (normal wear, overstressing climatic conditions, etc) at key points on basic airframe structures. Points are also assessed to the airframe during ACE inspections which indicate the condition of the paint.

The MWO program is budgeted at approximately $17 million per year and applies an average of 14,000 modifications to the Army's helicopter fleet. Most of these modifications (64.6%) improve aircraft operational characteristics but improvements to reliability & maintainability (20%) and safety (15.4%) are also being accomplished.

Component Tracking. Component tracking with aviation is not new — centralized component tracking is common within DOD services, Coast Guard, and most commercial carriers. Within Army Aviation, the central database is known as The Army Maintenance Management System-Aviation (TAMMS-A) or TAMMS-A Component Tracking System (TACTS).

The cornerstone is the three-copy set, DA Form 2410. The set is designed to capture maintenance and usage data from major events within the life of a given component. Those events are acquisition to inventory, installation on next higher assembly, removal from next higher assembly, major repair/overhaul, modifications, and loss to the inventory.

The form set is designed so that the 2410 set is completed at time of component installation and a new 2410 set is initiated at time of component removal; thus, the life of a component is tracked.

Without a 2410, a tracked component is rendered unserviceable. While component tracking is not new, the analysis of usage and maintenance data available from these databases is recent. Management of the entire tracking system has or is being re-engineered to enhance evaluation processes of materiel characteristics.

Most of the re-engineering efforts are occurring internal to ATCOM's Maintenance Directorate and should be transparent to field users. However, once evolution of the system is complete, field support for analysis of component related problems will increase significantly.

There are several current DOD and Army initiatives that can only be supported through the tracking system. The DOD initiative to eliminate "bogus" parts entering civil operations through the surplus of unserviceable components is placing a high demand on reconstruction of parts' life histories.

Further, efforts to bridge the wholesale/retail schism to gain complete component life cycle information has made use of the analysis features available through the tracking system. With shrinking resources, full utilization of information is vital to continued safe and effective operation of Army Aviation.

Biannual Scheduled Maintenance Reviews. A program to review scheduled maintenance inspections on the Apache, Black Hawk, Chinook, and Kiowa has been undertaken based on the initial review of UH-60 Preventive Maintenance Service (PMS)-1 and PMS-2.

This was a cooperative undertaking between the Directorate for Maintenance, the Project Management Office, and Sikorsky to minimize inspection manhours without impacting aircraft reliability.

The Proof of Concept resulted in a range of savings between 6.7 and 45.8% of manhours expended for PMS 1 and 2. The current schedule for completion of each review is AH-64/30 June 96; OH-58/30 August 96; CH-47/30 June 97; UH-60 (second re-view)/30 October 97.

Maintenance Information Message (MIMs). In May 1995, ATCOM Regulation 750-12 was approved to provide policy and procedures for publication of MIMs. To date (22 November 95), a total of 13 have been formally issued with three more currently in process. The MIM provides a rapid method for issuing non-safety related maintenance information to field units worldwide.

Ozone Depleting Chemical (ODC) Elimination. Pursuant to public law that prohibits production of Class 1 ODC effective 1 Jan 96, a massive effort is being worked to eliminate all references to Class 1 ODCs in Army Aviation TMs and Depot Maintenance Work Requirements (DMWRs).

To date, a total of 399 Aviation DMWRs (65,000 pages) have been reviewed with change documentation in process. Beginning in September 1995, review of all Aviation TMs (100,000 pages) began. Change pages to TMs will occur as technical information is approved.

Nearly all Class 1 ODCs, e.g., tri-

chloroethane, used in Aviation publications are cleaning solvents. Many are used in critical applications and there are no simple panaceas or "one for one" plug-in substitutes.

Each application requires technical review and tailored substitutions of non-hazardous materials in lieu of the Class 1 ODCs.

Specialized Repair Activity (SRA). Field units have continued to submit SRA requests at an active pace. During 1995, more than 160 new SRA requests and 140 renewal requests were received/processed.

An SRA summary data report was developed/distributed to SRA field sites for review and comment. The report is currently being updated and will be published as a Technical Bulletin in early 1996.

Nondestructive Test Equipment (NDTE) Program. Procurement of all four NDTE items (i.e., Eddy current, X-Ray, Ultrasonic, and Bond Tester) is now in progress. Procedural TMs for AH-1, OH-58, and CH/MH-47 series aircraft have been drafted with remaining manuals scheduled for completion in February 1996.

An informational video for Army NDTE was completed. Scripts for additional training videos are being prepared for the above cited four items of equipment, as well as the AH-1 series aircraft.

Actions are proceeding to the long-awaited First Unit Equipped (FUE) date of Third Quarter Fiscal Year 1996.

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Mr. Kruvand is the Director of Maintenance, U.S. Army Aviation and Troop Command (ATCOM), St. Louis, MO.

BY COL RICHARD A. CODY

TRAIN TO SUSTAIN: 1ST CAVALRY AVIATION MAINTENANCE

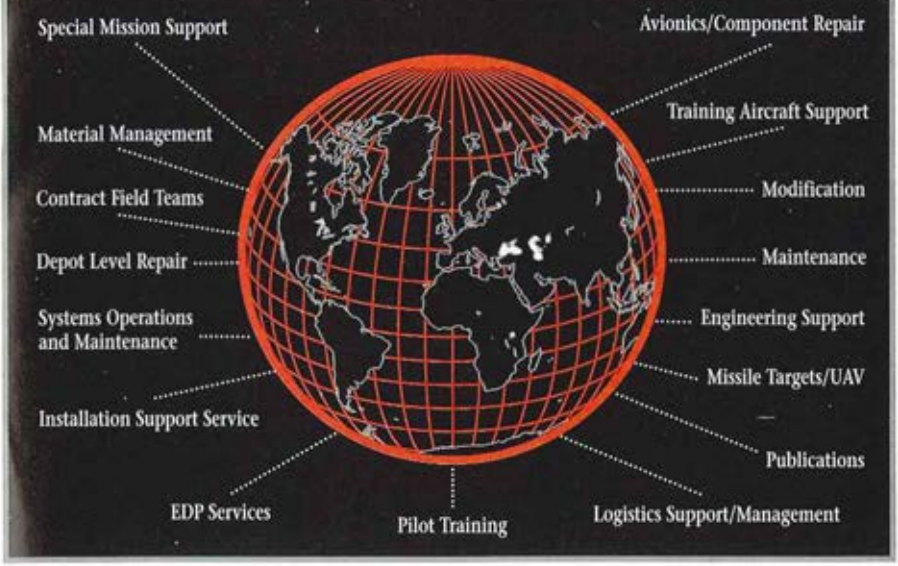
How the 1st CAV ensures it is always ready to deploy.

The 1st Cavalry Division's aviation maintenance program is designed to provide the maximum combat power for sustained combat over extended ranges. Maintenance is an integral part of our combat formations and forms the basis for all operations. All members of the aviation community contribute to the readiness of our air mechanical fleet. The following aviation maintenance management tools and concepts ensure the success, flexibility and responsiveness of aviation programs:

P4T2. Systematic mission analysis is a key practice for the tactical leader, at all levels. METT-T is much more than a clever acronym. It is a process developer which applies to all, regardless of experience, rank, or position. It is the focus on this process which gives the ability to synchronize and manage tactical decision making and lays the foundation for the operation order/plan.

Mission analysis is arguably just as critical for the maintainer. Synchronizing the myriad tasks and action which go into the maintenance of our high tech weapon systems is an on-going challenge. METT-T, however, requires modification to the unique requirements of maintenance problem solving. The 1st CAV solution is the use of P4T2 to describe this process. This acronym represents the following mission analysis:

- *Problem* — A succinct problem definition which truly reflects the bottom line after a thorough trouble shooting assessment. This is contingent on an accurate definition of the problem. Without a well defined problem, you end up performing "exploratory maintenance," which is costly in time and parts. Take the extra time to properly troubleshoot.
- *People* — Do you have not only the required amount of soldiers, but also the technical expertise and experience to complete the job? WHO IS IN CHARGE? Always assign a supervisor responsibility for the job and hold him accountable. Never waste your soldiers' time by not effectively managing your resources.
- *Parts* — Are the right parts on hand; on order; and/or available for each



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maintenance task? What configuration are the parts on the airframe? Stock Funded depot level repairable? For want of a shoe ... the battle was lost! Don't let a packing or washer keep a 16 million dollar helicopter grounded.

- *Plan* — Based on a complete analysis of the Problem, People and Parts, what is the *critical path* to put the weapon system back up? Are there risks in your plan? Have you sent WARNOs to AVIM? The plan must be dynamic, innovative, and adaptable. This is the blueprint, the OPORD, for action. It must be reviewed and updated throughout its execution. Factor in the consequences of your decisions. Controlled substitution requires negative maintenance and involve risk. What is your back-up plan? (AVIM, Depot. etc.)
- *Time* - What is the standard set by the commander? Does it support METT-T? No maintenance action should be open-ended. An AH-1 phase should take 15 working days; an AH-64 phase should take 18 working days; an "S" service on a HMMWV should take two days. Will deferred maintenance require more time now, or more time later?
- *Tools* — The right tool for the right job. Keep away from "bigger hammer/goodintight" maintenance. Watch calibration and special tool availability.

1st CAV Standards for Phases. Getting control of scheduled maintenance is key to posturing the maintenance program for unscheduled maintenance and more importantly, ensuring there is bank time to sustain aviation combat power for a 911 division. The 1st Cav has established and proven an aggressive standard for phase maintenance based on specific aircraft MDS:

OH-58 = 15 days
UH-1H = 21 days
AH-1F = 21 days
UH-60 = 30 days
AH-64 = 30 days

Every phase is preceded by an *in-depth* P4T2 briefing by the Phase Team Leader to the AVUM or AVIM commander, for the decision to start the phase. The process is not complete until the Phase Team Leader conducts a thorough P4T2 AAR with his team after the phase aircraft is test flown.

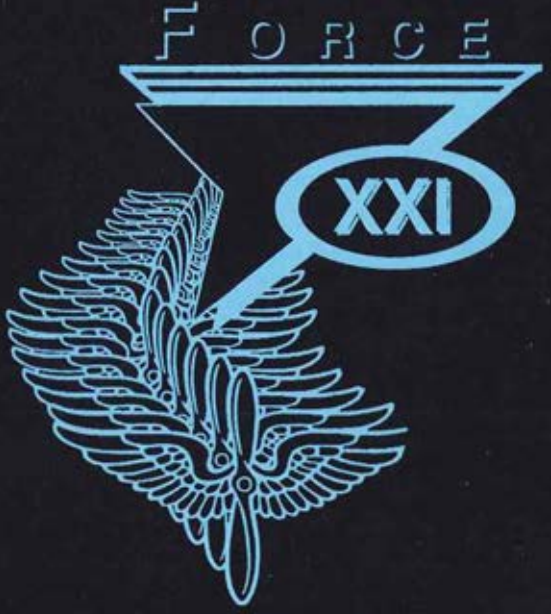
Synchronization. The AVUM production control is the primary synchronizer of maintenance. This requires a knowledge of capabilities and limitations at the Organizational, AVUM, AVIM and Installation level. Each level has a finite work-load potential which must be balanced and coordinated to maximize the strengths and weaknesses of our system and resources. The crew, after proper analysis, reports the problem to the AVUM PC. At this level, decisions concerning P4T2, cross leveling, PLL availability, QC, special tools and allied shops are made based on the AVUMs wider field of view.

The AVIM focuses 67 series MOSs on-site to work on the aircraft while component repair migrates to divisional or non-division shops. Class IX repair parts are worked through the AVUMs tech supplies through the SSA and into the OSC gateway at Fort Hood, TX. NMCS parts are managed with a requisite sense of urgency. AIMI and Corps level RX parts are walked through the system to 4th CMMC. Other NMCS parts are called in to ATCOM or CECOM and ordered as AOG. NMCS rates are typically less than three percent.

Command Emphasis. Aviation maintenance is intrinsic to sustained aviation combat power. Phase maintenance is Table VIII Gunnery for our maintainers. Pride of ownership and

(1st CAV — continued on page 25)

ARMY AVIATION....



the future is

NOW

AVIATION BRIGADE COMMANDERS' CONFERENCE 1996 YEARBOOK

ARMY AVIATION. . . THE FUTURE IS NOW

As we begin 1996 with the Aviation Brigade Commander's Conference, we have adopted the theme "Army Aviation...The Future is Now". That theme reflects reality — we are bringing the future to us and the following articles will make the case.

"...we are building a new foundation to fight our future aviation force."

Our Army's senior leadership has set the course for our future Army, and the aviation community is in synch with this azimuth. We are well aware of the diverse challenges we face and our vision for the 21st Century is continually evolving to address these diverse challenges. The Army's focus for our future is very clear, and Army Aviation is a full partner in that vision as a relevant force for the 21st Century.

Our vision is broad but operationally focused to ensure that we maintain our position as a major contributor on the joint and combined arms battlefield. Our goal is a balanced force with application across the entire continuum of full dimensional operations. We are utilizing emerging technologies, but most importantly, we are capitalizing on Army's Aviation's quality people to realize that vision -- our people are our future.

Doctrine is an integral part of our vision and we are building a new foundation to fight our future aviation force. It focuses not only on combat operations, but operations that support peace, humanitarian relief and governmental assistance. We recognize that Joint, Multinational and Combined arms operations will be the norm rather than the exception and the new Aviation capstone document, FM 1-100, reflects that fact.

From participation in recent operations, we have experienced the employment of aviation across the entire spectrum. Based on lessons learned from these operations and ongoing experiments, we have written our own USAAVNC Pam 525-5, *An Operational Concept For Army Aviation In Force XXI* and drafted USAAVNC ST EX4-1, the Tactics, Techniques and Procedures for how we will operate. Both of these documents will evolve over time — they will chart our future and ensure Army Aviation remains focused on combat, and capable of decisive victory.

Our vision encompasses more than just doctrine and operations. It also provides a

AVIATION VISION

AVIATION IS THE RELEVANT FORCE FOR THE 21ST CENTURY PROVIDING COMBAT, COMBAT SUPPORT, AND COMBAT SERVICE SUPPORT CAPABILITIES ACROSS THE SPECTRUM OF FULL-DIMENSIONAL OPERATIONS. ITS INHERENT VERSATILITY, MANEUVER ADVANTAGE, AND WARFIGHTING EFFECTIVENESS WILL INFLUENCE ALL DIMENSIONS OF THE FUTURE BATTLESPACE. HIGHLY MOTIVATED AVIATION SOLDIERS, EQUIPPED WITH MODERN SYSTEMS AND TRAINED TO WORLD CLASS PROFICIENCY, WILL PROVIDE COMMANDERS AT ALL LEVELS AN EXPONENTIAL INCREASE IN LETHALITY, THE LEADERSHIP TO HARNESS THE TECHNOLOGICAL REVOLUTION OF THE DIGITAL BATTLEFIELD, AND THE ABILITY TO ACHIEVE DECISIVE VICTORY.

basis for how we will organize and train. Part of our vision involves the Aviation Restructure Initiative and aviaition modernization plan.

The aviation modernization plan is based on a strategy which maintains only the required numbers of systems identified as necessary to support our core missions. Kiowa Warrior procurement will satisfy our interim requirements for reconnaissance. The contract for UH-60 procurement has just been renewed for 18 more a year through 2001, however it will still leave us 610 airframes short of the total Army requirement. We are working on a program to upgrade the CH-47 Chinook cargo fleet to keep that critical airframe relevant. The first unit to be fielded with Apache Longbow program will be in 1997 at Fort Hood. Comanche is still the centerpiece of our fleet for operations in the next century. The battle lab concept was established as a means to experiment with new and changing methods of warfare. Our Battle Lab Support Team (BLST) is shaping the future today, by providing critical insights into future operational concepts, doctrine, materiel and organizations.

A few brief examples will show you what I mean. "Roving Sands" and the Theater Missile Defense (TMD) Army Warfighting Experiment (AWE) featured attack helicopters in live and constructive simulation to develop Army Aviation's contribution to TMD. We proved very successful and increased aviation capabilities are now an integral part of the Army's Theater Missile Defense Plan.

In "Prairie Warrior 95," conducted in May at Fort Leavenworth, CGSC students portrayed corps, division and brigade commanders and staffs on a future battlefield. This experiment used constructive simulation with an aviation objective to demonstrate the

value of Comanche, Longbow Apache, and the Army Airborne Command and Control System (A2C2S). Here again Army aviation demonstrated a tremendous capability in supporting the corps commander's operational intent. The synergistic effects of the Aviation Mission Planning System, the UAV/Ferret, Comanche and the Longbow Apache were evident as combat multipliers.

Army Aviation is a full partner in the Force XXI program and with the collective efforts of the Aviation team we are providing our Army a fully modernized and digitized aviation force for the 21st Century. The Future is Now.

GEN Hartzog recently said, "The Army's focus is clear: train and maintain an Army capable of decisive victory on any battlefield, today and in the future." We at the U.S. Army Aviation Center are dedicated to doing that, to building and training Force XXI Aviation force characterized by versatility and lethality. We have a vision for our installation as a 21st century power projection platform, committed to:

- Developing a Total Army Aviation Team of soldiers, civilians, contractors, retirees, and family members dedicated to mission accomplishment in peace or war.
- Creating a world class aviation training facility capable of producing world class aviation warfighters for the 21st century.
- Creating an enduring and continuously improving community of quality facilities and outstanding services providing a superior quality of life.
- Being a valued neighbor, trusted partner, and recognized leader in community management and administration earning a reputation as a vanguard installation.
- Being proactive environmental stewards for present and future generations — committed to conservation, preservation, and enhancement of our national surroundings.

We have refined our curriculum to train the warfighters of the 21st Century. We are doing exciting things in our leader development courses and looking at new concepts for modernized flight training programs in a process called Flight School 2000. We have also developed a systematic training concept in which simulation is the primary training environment for skill validation and aircraft are used primarily for task verification and mission training.

As we talk about the impact of change, there are a couple of important values that will always remain constant. The importance of competent leadership and a sincere commitment by officers and NCOs to take care of our soldiers and their families, the importance of pride in what we do, the reliance on the basic values — values that have served as a guide for over 200 years and in my view will lead us into the 21st Century and beyond. We are inculcating those values in our young soldiers — The Future is Now.

As I mentioned before, the Army's senior leadership has a clear vision "to remain trained and ready, serving the Nation at home and abroad, a strategic force capable of decisive victory...into the 21st Century." GEN Reimer has stated that "America's Army must be ...The world's best Army — trained and ready for victory. A total force of quality soldiers and civilians... a values-based organization which is an integral part of the joint team, equipped with the most modern weapons and equipment our nation can provide, able to respond to our nation's needs, changing to meet the challenges of today ... tomorrow ... and the 21st Century." And I believe Army Aviation is an integral and important part of all that. The Future is Now, so catch the spirit and remain "Above The Best."

★ ★

MG Adams is the Aviation Branch Chief and Commanding General, USAAVNC and Ft. Rucker, AL, and Commandant, U.S. Army Aviation Logistics School, Ft. Eustis, VA.

BY COL WILLIAM POWELL
and MAJ JESSIE FARRINGTON

THE RELEVANT FORCE FOR THE 21ST CENTURY

The USAAVNC Doctrine and Simulation vision.

Comanche, Longbow, Digitization, the seamless synthetic battle field of virtual, constructive and live simulation are all Army Aviation watchwords of the 21st century. Army Aviation is leading the Army in technology growth and exploitation.

Training, doctrine and simulation and their interlinking are the key to any successful modern day Army. Easy to talk about and conceptualize but hard to develop and produce into a coherent strategy. Army Aviation's strategy is to provide world class individual, leader, and unit training; visionary doctrine, and simulation that solidifies Army Aviation collective and combined arms training.

How do we do it? Through modern institutional training (Classroom XXI), Advanced Warfighting Experimentations (AWEs), institutional and unit constructive and virtual simulation initiatives and Validation of it all at the Combat Training Centers (CTCs) with live simulation.

Institutional Training Initiatives. As we move into the 21st century, the need for the application of modern training technologies in the academic classroom becomes imperative. The reduction of resources for training demands we move forward to utilize all resource saving techniques. Studies indicate modern teaching techniques and tools increase retention and decrease training time. The Army Aviation Warfighting Center is moving ahead to establish modern electronic classrooms.

Operations DESERTSHIELD/DESERT STORM brought to the forefront the need for training standards which span all Active and Reserve Component Units. The Total Army School System (TASS) is most efficient when the same technology is used to train at the proponent school and across AC/RC requirements. The application of modern multimedia training techniques and technologies into Army classrooms is the main thrust of the Total Army School System (TASS) initiative. The Army Aviation Warfighting Center is taking steps now to establish a plan for modernizing its training.

The Classroom XXI initiative is aimed at bringing Army classrooms into the 21st

AVIATION TRAINING VISION

FOUNDATION

INSTITUTIONAL TRAINING

1. Leader Development
   a. Officer Basic Course
   b. Advanced Course
2. Flight Training
3. Advance Aircraft Systems Qualification
4. Company Commanders Courses
5. CGSOC
6. Pre-Command Course
   a. Battalion
   b. Brigade
7. War College

PREPARES LEADERS

century. This classroom will allow students and instructors alike to interact in real time with their counterparts at other branch schools. For an example, in FY 97 via the Internet, Officer Basic Course (OBC) classes at Rucker, Benning, Knox, and Sill will have the capability to interact, reinforcing the combined arms concepts which are vital for today's force projection Army. It will also allow for "non conventional" training techniques wherein students will interact with the computer which will tailor instructional scenarios to student data gathered from previous courses and during pretesting.

The application of technology in the form of Video Teletraining Facilities, Interactive Courseware (also known as Computer Based Instruction, and Computer Bulletin Boards and Networks allow the dissemination of knowledge quickly and easily. With today's rapidly changing weapons systems and tactics, the need to "get the word out" is more imperative than ever.

Via the network, Field Units and Reserve Component Schools can "log on" and down load the most recent, up-to-date information on a given subject. Through the use of the modern classroom and its network, the concept of one force is possible with Reserve and Active Components trained and tested to the same standards. This remote access to training is called Classroom Without Walls. It involves the nontraditional conveyance of training materials to the student both at the school and at her/his unit. The Aviation School and Branch will utilize these technologies to their fullest to ensure that all U.S. Army Aviation Soldiers are fully trained and ready for battle.

Doctrine. Emerging Army doctrine on the Force XXI battlefield must be flexible

and dynamic in order to support the variety of operations we will be called upon to execute. Emerging doctrine must be domination based, focusing on the total domination of the battlespace rather than threat (cold war) or capabilities (current model) based. The force structure that supports this doctrinal shift must be versatile enough to perform a variety of missions in combat and other operations, agile enough to cover large areas with minimum force, and tailorable to support future force packages. New systems being fielded will expand these capabilities exponentially.

Domination based doctrine requires us to see the enemy throughout the commander's battlespace and mass the effects of all our joint weapons systems delivering overwhelming combat power to the decisive place and time. The traditional battlefield framework of close, deep, and rear will become convoluted and ambiguous as forces become dispersed and noncontiguously deployed and the battlefield becomes more nonlinear. Army Aviation will be at the forefront of this doctrinal shift due to several of its unique abilities.

Reconnaissance and attack aircraft can move rapidly across the battlespace acting as both a sensor and a killer. Their secure digital data links with JSTARS will provide a clearer common picture of the battlespace to all joint forces. These links will also allow the commander to immediately retask any of those Army Aviation reconnaissance assets when a more critical mission requires eyes, steel, or both on target. Comanche will operate hundreds of kilometers from supporting ground forces, locating and identifying critical enemy and friendly assets and transmitting this data in real time to the ground maneuver commander.

That real time picture of the enemy is only valuable to the commander if he has an attack asset capable of engaging it. Comanche is both a sensor and shooter. It can feed its picture of the enemy to other joint attack assets or use its organic weapon systems to destroy it directly and provide immediate BDA. Its reduced radar signature, FLIR and organic long range weapon systems will make direct action possible and survivable without degrading the systems value as a sensor. Armed UAVs and SOF forces can also take direct action but lose their reconnaissance capability in the process. Army Aviation can immediately shift back to reconnaissance after an attack.

Real time situational awareness of the enemy's strength and location will require the commander to rapidly communicate with and shift forces throughout his battlespace. Assault, utility, and cargo helicopters provide the fastest way to shift his forces to exploit his knowledge and resupply forces spread over large distances regardless of the terrain, obstacles, or availability of roads. The modular design of many of these organizations at the corps level will allow for simple task organization to support even heavy divisions on the move. A utility company can return an armor company's worth of combat power to the fight each day through expeditious resupply of parts and major assemblies. A task organized Chinook company from corps or EAC could return an armor battalion's worth. A^2C^2S will provide the ground maneuver commander with both the real time picture of the battlespace and the necessary communications assets to pass the critical data to his forces or other joint forces anywhere on the battlefield.

No other force provides the commander with as many ways to mass the effects of all his assets at the decisive place and time. Army Aviation will identify the window of opportunity and help the com-

mander exploit it with fire and maneuver.

Advanced Warfighting Experimentations. Advanced Warfighting Experimentations (AWEs) are designed to execute emerging doctrine, test new force structures and evaluate the capabilities of future combat systems. As with the new systems strategy of simulate before buying, AWE simulates future warfighting doctrine and capabilities before we field new units or execute new doctrine. Army aviation has proven itself to be the center pole for future Army capabilities. Army Aviation participated in three critical AWEs in FY95, Roving Sands 95, Prairie Warrior 95, and Focus Dispatch 95. These AWEs are examples of the contribution to warfighting Army Aviation will lend to FORCE XXI.

Roving Sands 95/Joint Project Optic Cobra was a joint Theater Missile Defense AWE conducted at Fort Bliss and White Sands Missile Range April-May 95. Army Aviation (6th CAV BDE) conducted Attack Operations in support of III Corps and 3rd Army Headquarters. Scenarios included Army Aviation conducting attack operations against simulated threat Theater Missile (TM) launchers and associated infrastructure. Attacks were executed during pre-launch and post-launch phases. Direct coordination between the Army Theater Missile Defense Element (ATMDE) and the corps aviation brigade was authorized by 3rd Army and III Corps.

The result was that Army Aviation demonstrated the capability to attack Theater Missiles and associated infrastructure with a high degree of success. Attack helicopters proved to be most valuable when precise target locations were not known. Attack operations were conducted 240 km from the forward assembly area. When the ATMDE was passing updated intelligence directly to the aviation brigade, attack helicopters were able to divert from one search area to another while enroute. The Intel/C^2 process went from the ATMDE to the aviation brigade at corps; from the aviation brigade at corps to the executing attack battalion's XO in an Airborne Command and Control Center; from the XO to the executing unit. This network provided timely intelligence and over-the-horizon communications capability. Army aviation killed more TMs during this AWE than any other combined arms or joint Attack Operations weapon system.

Prairie Warrior 95 AWE was a capstone learning experience for the CGSOC in the form of a Battle Command Training Program "Warfighter" exercise at corps and division levels. Army Aviation's most significant participation was in the Mobile Strike Force (MSF). Its mission was to attack the best equipped corps-sized force available to the enemy in that period. The MSF Aviation brigade (with 2010 technology) conducted precision deep strikes using automated planning tools, situational awareness, UAV/Ferret, Comanche, and Apache Longbow.

The results being that Army Aviation was the centerpiece of the MSF. Commanders referred to aviation attack assets as the "top killer" and the "focus" of the main effort. Aviation performed reconnaissance in the early phases, and, as the situation developed, brought tremendous firepower to bear. The key was that aviation provided great flexibility, possessing the capability to react quickly as the battlespace changed.

The Aviation Branch participated in AWE FOCUSED DISPATCH, 7-31 August 1995 at Fort Rucker. The aviation experimental force (EXFOR), 1-502 ATKHB, 2d Armored Division, provided their battle staff and one company of AH-

64 aviators for the experiment. This experiment focused on development of digital TTP. USAAVNC will develop TTP for the aviation brigade, attack helicopter battalion, assault helicopter battalion, air cavalry troop, AVTOC, A^2C^2S, Longbow, Kiowa Warrior, and Aviation Digital Communications Architecture.

There were several broad areas of interest for FOCUSED DISPATCH. This AWE included helicopter to helicopter communications, helicopter-ground communications, and the use of digital systems to accelerate, and improve the quality of, the staff planning process. Emerging insights include:

- Doctrine will not dramatically change with digital systems, but the TTP to execute the doctrine will.
- Digital systems will not eliminate TACSOPs or crew drills.
- Because of the large volume of information, the battle staff must completely understand the commander's intent to provide required information for decision making at the right time.
- What aircraft will the aviation commander fly? Must he be a computer operator? Is his post the A^2C^2S or AVTOC?
- Digitization must be taught in all leader development courses.

Simulation. Army Aviation Simulation Strategy will provide constructive simulation; that will train leaders and staffs; virtual simulation that will train individuals, crews, leaders and units collectively; and live simulation that will train leaders and units on the combined arms battlefield. Simulation will complement current training not replace it. Constructive, virtual and live simulation when effectively linked provides the commander a trained and ready force.

The approach will be to update current aircraft simulators and develop an Aviation Combined Arms Tactical Trainer (AVCATT). These critical simulators will sustain aviation collective training at the company level and sustain combined arms training using live simulation (MILES/AGES II) at the Combat Training Centers (CTCs). Exploiting constructive (CBS/BBS) and virtual simulation (Aircraft simulators, AVCATT, Future Embedded Simulation Systems) during homestation training will ensure successful collective execution. The validation of this will be conducted using live simulation (MILES/AGES II, Future Tactical Engagement Systems (TES)) during Force on Force combined arms operations at the Combat Training Centers (CTCs).

Combat Training Center Simulation. As a part of that total combined arms force, Army Aviation has been and must continue to be prepared. Without an Aviation Combined Arms Tactical Trainer (AVCATT), the only means to accomplish this is through force-on-force collective training at the CTCs.

At this time, tactical engagement simulation of the various battlefield weapon systems at the CTCs rely primarily on eye-safe laser direct-fire devices. However, in the near future the use of Simulated Area Weapons Effects (SAWEs) simulations utilizing the Multiple Integrated Laser Engagement System (MILES) II, will allow more accurate position reporting through Global Positioning System (GPS) satellites. MILES II will also add multi-level casualty assessment (communications, firepower, mobility and catastrophic kill status) and provide additional indirect weapons codes for conventional and NBC weapons.

FORSCOM schedules use of the MILES AGES II devices for training at the NTC, as a part of its total training strategy. The Program Manager for Training Devices is working on improvements, including: Hellfire range; shot-to-kill ratio; weapons

symbology; use of aircraft prime power verses battery power; boresighting procedures; and laser rangefinder operations.

Future devices will have to address the capability of fire-and-forget acquisition and weapons systems. Program Managers for the Longbow and Comanche have already begun development of the Tactical Engagement Simulator System (TESS) for both the Longbow and Comanche. As a replacement and enhancement to the current MILES AGES II, TESS is envisioned as being an embedded/appended system capable of simulating all the weapons capability of the Longbow and Comanche.

The primary collective threat training system, the ASET-IV, was introduced at the National Training Center in Oct 93. As an aircraft threat simulator, each ASET-IV set consists of 6 modules; a Command/control/communications, an SA-8, two ZSU-23-4, and two SA-9 vehicles. Additionally SA-7/14 manpads provide increased realism. Each module is to be equipped with MILES II which allows engagement scoring. Although ASET-IV is a collective unit trainer, it performs more of an evaluation of the unit's capability to conduct operations in an EC battlefield environment.

Because of the tremendous amount of data collected and the computer systems in place, it is envisioned that the CTCs could also be linked to other locations through a Distributive Interactive Simulation (DIS) compatible network of simulators, thus allowing Semi-Automated Forces and other weapon simulators to interact with a rotational unit, the CTC Opposing Forces, or other synthetic battlefield forces. The potential implications for networking in this manner are unlimited. Simulation could make joint operations, mission rehearsals, and train-up for various deployments faster, more productive, and lower in cost.

Unit Training Simulation — AVCATT. AVCATT is the platform which aviation units use to conduct and sustain collective training. Additionally AVCATT will prepare aviation units for combined arms operations. The virtual collective environment, inherent to AVCATT, will enhance unit readiness by providing opportunities to rehearse command, control, and communications. A unit that trains in the virtual collective environment of AVCATT will be more successful during live collective simulation at the CTC. AVCATT will also provide a platform from which aviation can participate in the Synthetic Theater of War (STOW).

The STOW is a newly developing mix of virtual and live simulations from across all branches of service. In theory, synthetic battles will be conducted in the future where Army, Air Force and Navy simulations all interact on the same virtual battlefield. Technology is also being developed to connect live simulations into this synthetic environment. Imagine an AH-64D company maneuvering in the live environment of the NTC, and interacting with a separate AH-64D company maneuvering in a virtual replica of the same terrain. This capability has tremendous potential for preparing aviation units, especially in the reserve component, for combat.

Training Strategy (Institution to CTCs). The three combat training centers provided the most focused, realistic and intense collective training opportunity available for our tactical units. The CTCs address a known and recurring training deficiency that can only be resolved in this environment: collective training and execution at the company, battalion and brigade levels. Only at the CTCs can our units experience high resolution, objec-

AVIATION TRAINING VISION

SUSTAINMENT

UNIT TRAINING (Building Warfighting Teams)

1. **Develops Leaders.**
2. **Sustains Individual Training.**
3. **Sustains Unit Collective Training.**
4. **Sustains Staff Training.**
5. **Prepares Units to conduct Combined Arms Training.**

PREPARES LEADERS AND UNITS ——

tively evaluated, training aided by the Tactical Engagement Simulation (TES). During these periods of dwindling fiscal resources and ever increasing demands on available CTC rotations, it is imperative that Army Aviation battalions and brigades participate as full players — in the box, with complete staffs and supporting attachments — in what is clearly the premier combined arms training experience, outside of actual combat. It is Army Aviation's vision that every battalion and brigade commander assigned to an MTOE unit experience a rotation to NTC, CMTC or JRTC during a normal two year command tour. Given the unique challenges and demands of our mission — spanning every battlefield function and reaching across the operational spectrum — our commanders and staffs must be the ultimate combined arms planners, integrators, and synchronizers on the battlefield. Nothing short of war can hone those acquired skills like a CTC rotation.

It is not only the rotation, but the preparation of it — the "road to war" — that provides an immeasurable value added. It is the development and execution of long range training plans, the "crawl, walk, run," of individual and small unit training, building over time to a peak of precision in collective execution. It is the melding of a commander and his battlestaff — learning the art of military decision making and adapting the process to the personal style of the commander — as plans and orders are developed and refined. It is TEWTs, MAPEXs, FTXs, and gunnery training. It is hands-on, battle-focused training. It is leader development, from the young PIC in the cockpit, to the platoon sergeant and platoon leader, all the way through the chain of command.

Still another collateral benefit is the

AVIATION TRAINING VISION

VALIDATION

CTC - "THE ROAD TO WAR"
(Synchronizing the Combined Arms Team)

1. **Institutional and Unit Training that culminates in the CTC.**
2. **Prepares Units and Leaders for War.**
3. **Operationally provides the leaders and units with the experience of the first few weeks of combat.**
4. **Validates Doctrine and Mission Area Tactic, Techniques, and Procedures.**
5. **Provides feedback that will eventually improve Individual, Unit, Institutional and Combined Arms Training.**

PREPARES ARMY AVIATION

high state of sustained combat readiness that is a natural derivative of preparing for a CTC rotation. There is no better event on which a commander can focus his training program and even perhaps, his vision for his command.

The CTC experience begins at home station in the months preceding the rotation, and units who will fight together should train together. Brigades have been tougher to include for a variety of reasons — not the least of which is that brigade level training has not been the focus.

It is important that we push for this to change. If we want to correct the "ad hoc" task force problem, and prepare for the "modular" future of specially tailored units coalescing for specific missions, our brigades must be trained to rapidly assimilate and integrate new units, plan operations, conduct liaison, synchronize and execute missions, and sustain the fight as an effective warfighting headquarters and battlestaff.

Many successful CTC rotations that have included aviation brigade headquarters have validated these concepts. Our brigade headquarters should deploy with their organic battalions whenever possible. The bottom line: brigades must learn to plan and battalions and companies must learn to execute.

To be equal partners in the combined arms team, and to meet the ever increasing demands that will be placed on our battalion and brigade commanders and battlestaffs, we must train to the same level of precision and resolution as any other maneuver arm.

What this really does is drive us towards an overarching training and leader development strategy with the CTC rotation as the culminating event. During the advanced course, our company command-

ers must become masters at both fighting their assigned weapons systems, and at understanding the integration of combined arms on the battlefield. During pre-command, battalion and brigade commanders must receive formal instruction on how to observe training and how to conduct quality after action reviews to maximize every training event.

Our simulation strategy will produce devices that will facilitate collective combined arms training up to company level, and integrate constructive and virtual simulation into an effective program that promotes and enhances battlestaff training.

The hallmark of our training strategy will be the CTC rotation, utilizing the TESS, the AAR process, and the proven abilities of the CTC Observer/Controller teams, to objectively validate both our readiness and the effectiveness of our education and training strategy (leader development, TADSS, simulation, and collective training). Home station training is no substitute.

Deficiency Analysis. The Army Aviation Warfighting Center organized a Deficiency Analysis Section under DOTDS to capture Army Aviation lessons learned and training deficiencies. With rapid changes occuring in doctrine, equipment and structure in the Army, the Aviation Warfighting Center has determined a need for a central clearing house to collect, assess, track and respond to deficiencies from the CTCs and Aviation Brigades. The outcome will be training solutions to performance deficiencies, recommendations for non-training solutions to performance deficiencies and improved training efficiency and effectiveness.

DAS will establish and manage a system to verify and track training and doctrinal deficiencies. The mission will be to:

- Reduce data to meaningful documentation.
- Validate training/doctrine deficiency.
- Determine who to notify of non training/doctrine deficiency.
- Coordinate with internal and external systems managers and training agencies to insure tracking and disposition of deficiencies.
- Follow up on suspenses and insure action/resolution or verification.
- Compose responses to the source/originator to complete action.
- Gather feedback from CTCs and Avn Brigades.

The Deficiency Analysis Section (DAS), in its infant stage, is operating under a six month probationary period. Currently the section has been working issues from the CTCs. The outcome of those issues will be published mid-January. The data will be analyzed, problem areas isolated and resolutions determined/recommended. Overall Army Aviation should benefit by:

- Allowing commanders to learn from one another's experiences.
- Creating an open dialogue between TRADOC and the field.
- Overcoming expensive mistakes and idle training time.

To accomplish the mission, identified deficiencies will be solicited from the field, CTCs, and professional publications. The DAS will utilize the electronic medias of EMAIL and the Internet and will interface with the current data banks of Center for Army Lessons Learned (CALL), Army Historical Archives System (AHAS), and Automated Digital Training Library (ADTL).

★ ★

COL Powell is the Director, Directorate of Training, Doctrine, and Simulation, USAAVNC, Ft. Rucker, AL. MAJ Farrington is Chief of the Gunnery and Training Aids Devices Simulator and Simulation (TADSS) Branch.

BY COL JESSE DANIELSON
and MAJ CLAY CARTER

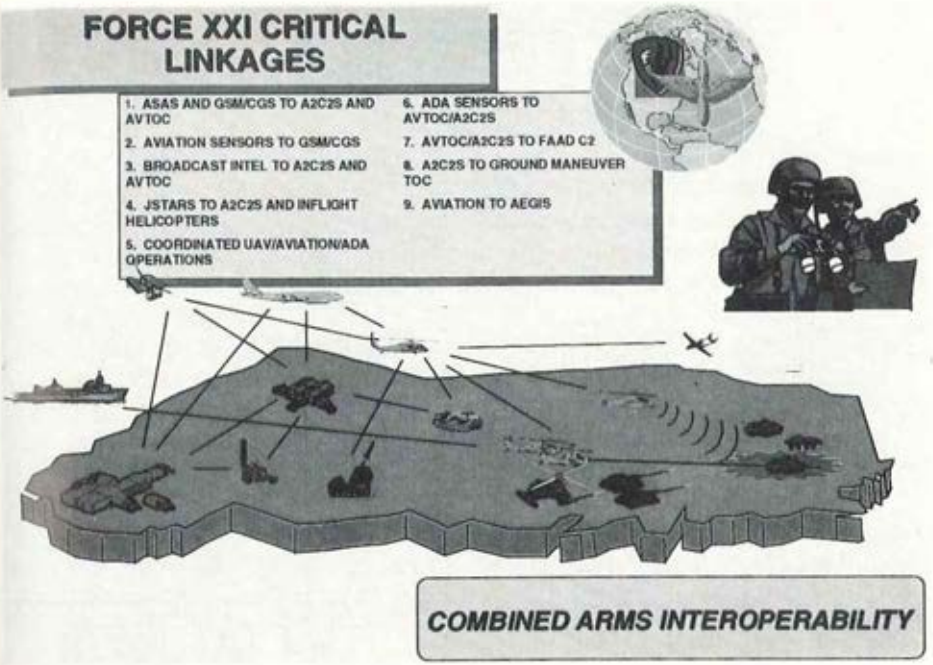
AGGRESSIVELY INTEGRATING AVIATION INTO FORCE XXI

The U.S. Army Aviation Warfighting Center is aggressively integrating Aviation into the Force XXI modernization process. The method by which this integration is executed is outlined in the Force XXI Aviation Campaign Plan. The Force XXI Aviation Campaign Plan for 1996 continues the effort to integrate organizational redesign and information-age technology to create an overmatching capability for US forces to dominate the battlespace. The plan focuses on achieving electronic linking of air and ground forces to portray a common picture of the battlefield and to increase synchronization of combat power.

Achieving electronic linking to increase synchronization of combat power.

Technology integration is formalized in Army Aviation's seven digitization programs; Global Positioning System (GPS), Have-Quick II, High Frequency (HF) Radio, Improved Data Modem (IDM), Aviation Mission Planning System (AMPS), Army Airborne Command and Control System (A^2C^2S), and the Aviation Tactical Operations Center (AVTOC). These programs address nine critical information links necessary to achieve shared situational awareness, improved command and control on the move and increased operational tempo.

The Aviation Restructure Initiative (ARI) is the basis for the redesign of Army Aviation forces. Aviation units participating in advanced warfighting experiments (AWEs) will be organized under the new design. Army Aviation has benefited from recent technology demonstrations and AWEs. The lessons learned from these exercises will be incorporated into the 96 campaign plan to further the development of the twenty first century aviation force. As insights are gained through the conduct of experiments, the lessons learned will serve as the foundation for the development of tactics, techniques and procedure (TTPs) to exploit increased capabilities provided by digitization. The goal of the Force XXI Aviation Campaign Plan is to determine the increased warfighting capability of a digital aviation force and assess the impact on Doctrine, Training, Leaders, Organization, Materiel nnd Soldiers (DOTLMS). In pursuit of this goal we



have established the following objectives:

Facilitate battle command.

Seamless aviation connectivity (scout, attack and maneuver BCV):

- Digital Communications
- Common Graphics

Evaluate Prototypes:

- AVTOC
- A^2C^2S
- AMPS
- HF NOE Comm
- HQ II
- GPS

Increased situational awareness:

- Intelligence connectivity and synchronization (J-STARS, ASAS, GSM, Longbow, Comanche, National Assets)
- Precision targeting/Increased lethality
- Force protection

Enhanced battlefield synchronization:

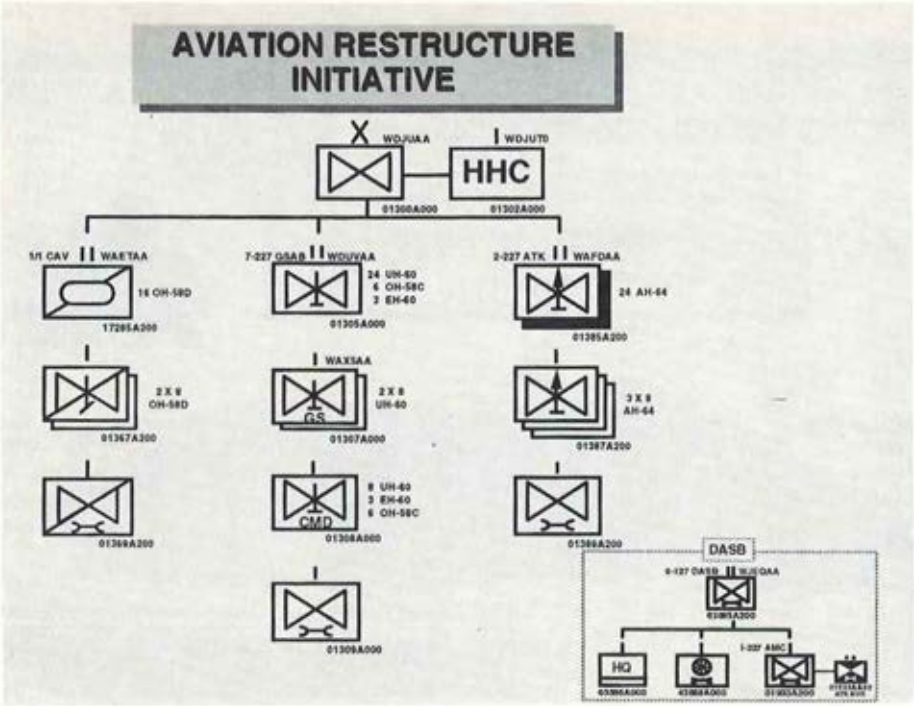
- Fast, precision mission planning (AMPS)
- Increased tempo
- Optimized CS and CSS functions

Demonstrate how Aviation enhances warfighting capabilities.

Determine Force XXI Aviation force structure issues.

By demonstrating the capabilities implied in these objectives, US Army Aviation will prove itself to be an invaluable component of Force XXI.

Army Aviation will participate in a series of Advanced Warfighting Experiments (AWE) Advanced Concept Technology Demonstrations (ACTDs) and Battle Lab Experiments (BLEs). These experiments and demonstrations are conducted to experiment with new equipment organizations, and Tactics, Techniques and Procedures (TTPs). The experiments that Army Aviation will participate in include: Survivable Armed Reconnaissance on the Digital Battlefield (SARDB),



Prairie Warrior 96, Intrepid Vision, and Brigade TF XXI. Lessons learned from these experiments, as well as those learned from previous experiments, will contribute to DOTLMS solutions for Force XXI Aviation.

SARDB is an Advanced Concept Technology Demonstration (ACTD) sponsored by the Joint Precision Strike Office (JPSD). It is a joint effort to develop, integrate, and demonstrate advanced concepts and technologies and doctrine that provide advanced reconnaissance capabilities to support the joint task force commander. SARDB will be executed through a series of constructive, virtual, and live demonstrations timed to leverage planned advanced warfighting experiments in the FY 97-99 time frame. A major objective of the ACTD is to demonstrate how advanced concepts and technologies enhance the warfighter's capability to conduct armed reconnaissance on the digital battlefield. It will examine operational utility, deployability, flexibility, survivability interoperability and connectivity, doctrine, tactics, techniques, and procedures. The payoff is a determination of the operational value of armed reconnaissance in conjunction with other national/theater/tactical surveillance/reconnaissance sensors with optimum connectivity on the digital battlefield, as well as to provide some leave behind combat capability to the units participating in the exercise.

Prairie Warrior 96 is an annual exercise conducted using Command and General Staff College (CGSC) students as commanders and staffs. It is the capstone exercise for CGSC and is a corps/division exercise conducted in a simulated Combat Training Center (CTC) environment. The exercise is conducted using a joint, multi-

SARDB FY 97-99 (PROPOSED) ACTD

PURPOSE

To demonstrate how advanced concepts and technologies enhance the warfighters capability to conduct armed reconnaissance on the digital battlefield to enable the commander to seize and retain the intitative; shape the battle; expand and control the battlespace; and achieve swift low casualty victory.

•EXAMINE ARMED RECONNAISSANCE IN EARLY ENTRY SCENARIO
•DEVELOP PROCEDURES TO INTEGRATE COMANCHE WITH COMPLEMENTARY RECONNAISSANCE AND SURVEILLANCE SYSTEMS
•MEASURE EFFECTIVENESS OF COMANCHE AND INTELLIGENCE/ SURVEILLANCE SYSTEMS
•PROVIDES EARLY OPPORTUNITY TO EVALUATE AND OPTIMIZE COMANCHE TTPS
•REFINE/RESOLVE DIGITAL BATTLEFIELD CONNECTIVITY ISSUES PRIOR TO FIELD TESTS IN FY 02

national contingency scenario.

The intent of the Prairie Warrior advanced warfighting experiment (AWE) is to continue the investigation of Mobile Strike Force (MSF), Joint Venture and Force XXI. Members of the experimental force (EXFOR) will be included in the student corps. Lessons from PW 95 will be incorporated in the exercise to improve PW 96. Battle Command Elective students will play the MSF with 2010 systems. PW 96 will provide an appropriate theater echelon above corps (EAC) command and control structure. There will be a provision for international officer participation in coalition brigades. Synthetic Theater of War (STOW) participation will be designed to advance development toward Force XXI requirements. Prairie Warrior becomes a "proof of principle" for the Division-level AWE which will be conducted in late 1997.

Proposed Army Aviation participation will examine the feasibility of the Aviation Brigade with it's digital and advanced sensor capabilities, performing the active RISTA mission of the MSF. The Aviation Brigade in conjunction with the Military Intelligence (MI) battalion would control UAV and other active acquisition systems.

Intrepid Vision is conducted to define concepts for simultaneous attack by future systems (FY2012); primarily aviation, field artillery, and intelligence, and the required information exchange and communication architecture to support these concepts. The experiment will focus on digital communications and command and control as they apply to future systems. The intended outcome will be a set of operational concepts using future systems and insights on critical requirements across DTLOMS.

PRAIRIE WARRIOR 96

GOALS

•PREPARE 21ST CENTURY JOINT LEADERS
•TRAIN FOR JOINT, MULTI-NATIONAL COMBAT OPERATIONS
•ASSESS FORCE XXI DESIGN PRINCIPLES, OPERATIONAL CONCEPTS, BATTLE COMMAND CAPABILITIES AND COMBAT SERVICE SUPPORT CONCEPTS
•PROVIDE LINKS FOR INVESTIGATION OF OTHER JOINT VENTURE ISSUES
BUILD ON THE PW95 STOW EXPERIENCE AND PREPARE TO LINK LIVE EXERCISE IN FY 97

The Experiment's objectives will be to define the capabilities of future systems and concepts for their employment; define the required information exchange between future systems and the communication architecture to support this exchange; to ensure future digital connectivity in the critical areas of sensors, shooters, and communications.

The experiment will be managed through a working group and a Council of Colonels. The BLWE is a two part phased operation. Part I will be conducted in FY 96 in an Army environment and has four phases. Phase I will define the future systems and concept for employment. It should occur sometime between November 1995 and February 1996. Phase 2 will be a virtual simulation phase conducted between March 1996 and May 1996. Its purpose will be experiment with inter-operability model test of TAFSIM, Aviation model, and IEW model over the DIS network. Phase 3 will center around constructive simulations and will occur between May and July 1996. Its purpose will be to explore constructive simulations on future systems employment and information exchange to show the value added using new concepts and equipment. Phase 4 will consist of recommendations to combat developers on voids/redundancies in systems and projects. Also, lessons learned during the experiment will be collected and disseminated. Part II will continue the work of Part I in a Joint environment in 1997. Phases for Part II have not yet been determined.

Intrepid Vision's areas of emphasis will be focused on sensors, targeting, digital communications, SEAD, protections, and mission planning. Proposed mission sets include establishing a lodgment, conduct of zone and area reconnaissance, air

INTREPID VISION

OBJECTIVES

- DEFINE CAPABILITIES OF FUTURE SYSTEMS (FY2010)
- DEFINE CONCEPT FOR EMPLOYMENT
- DEFINE REQUIRED INFORMATION EXCHANGE
- DEFINE FUTURE SYSTEMS COMMUNICATIONS ARCHITECTURE
- ENSURE FUTURE DIGITAL CONNECTIVITY IN CRITICAL AREAS OF SENSORS, SHOOTERS, AND COMMUNICATIONS

assault options, raids, and precision strike operations. The threat target sets include critical targets, armor formations, enemy reconnaissance, and logistics/C2 nodes.

Task Force XXI AWE will be conducted using the latest experimental force (EXFOR) to be designated by the Army, the 2d Armored Division. The division will be the Army's vehicle to experiment with new Information Age technologies and guide our Army int the 21st Century. Although the EXFOR will experiment with new technologies, its primary focus will be to investigate new organizational designs and battle command concepts. The first step down the path to the 21st Century will be a brigade size advanced warfighting experiment culminating at the National Training Center in February 1997. Designated Bde TF XXI AWE, the experiment's objectives are: develop a task force organization that leverages capabilities of information age technologies, determine the implications of TTP, organization and technical enhancements on soldiers/leaders, simultaneously experiment & integrate technology insertions, organizations and TTP, determine the appropriate TTP associated with an information age force, experiment with enhanced battle command capabilities, and analyze appliqui and software with sufficient rigor to make subsequent acquisition recommendations.

The Aviation task force supporting TF XXI in the AWE is a general support (GS) battalion with an attack company (AH-64A), cavalry troop (OH-58D), medium lift helicopter platoon (CH-47D) and an attack section consisting of two prototype Longbow Apache (LBA) attached. Digital equipment includes: two A2C2s, one brigade-sized AVTOC, eight OH-58D Upgrades, two AH-64Ds, 12

AMPS, eight UH-60s with appliques, and four CH-47s with appliques. Equipment will be provided with training, operators manuals and new TTP for employment.

Digital connectivity with the aircraft (OH-58D, AH-64D and A^2C^2S) is through variable format message sets (VMF) or Air Force Advanced Application Program (AFAPD). Digital Connectivity to the ground brigade will be over appliqué software and Phoenix software. The OH-58D will be able to digitally communicate with all ground vehicles with appliqué. The AH-64D will be able to transmit target message sets to the enhanced ground station module through the improved data modem.

Lessons Learned provide an evaluation of Aviation's progress towards the TRADOC CDR's digitization and warfighting goals based on findings from the major AWE's conducted during FY 95. The following are summarized emerging results from AWEs conducted to date.

The general finding from TMD AWE is that the use of multiple intelligence sources does enhance situational awareness.

Prairie Warrior 95. A specific component of the battlefield picture important to both aviation and field artillery is Army Airspace Command and Control (A2C2). A2C2 is to be managed through a complex of systems called the Tactical Airspace Integration System (TAIS). The conclusion from Prairie Warrior 95 was that adequately trained personnel who understand the theater level ramifications of airspace utilization can effectively manage corps level A^2C^2 with a mock-up TAIS system. Recent considerations have been given to extend the basis of issue of TAIS from corps through division to the aviation brigade. Some support was obtained for this BOIP from Prairie Warrior although it was not unambiguous. The MSF commander made the decision that A^2C^2 for the MSF would be a brigade function. The resulting A2C2 was not as accurate as that achieved at corps. This may have been a function of systems used, e.g. Phoenix (Battle Command Decision Support System) in lieu of TAIS, staffing levels, experience and training, or information flow. Nevertheless, the DA level evaluator assessed that A2C2 system /software development appears valid.

Theater Missile Defense (TMD) AWE. When available during TMD, the Air Force's Airborne Command and Control Center (ABCCC), was a key node supporting the command and control requirements of aviation missions. The Aviation Brigade Executive Officer was on board the ABCCC with mission divert authority. The ABCCC would have line of sight and therefore connectivity to aviation maneuver elements. The XO aboard the ABCCC issued mission divert orders to an attack helicopter element which already departed a mission to attack a different target. The new targets were detected by an unmanned aerial vehicle (UAV). The diverted aircraft were able, using strap-on global positioning systems (GPS), to find and destroy the new targets.

The general finding from TMD AWE is that the use of multiple intelligence sources does enhance situational awareness; but unresolved questions of roles, missions, and functions; a lack of understanding of strengths and weaknesses ofvarious forms of sensor data; a lack of a common map base and emphasis on information colla-

tion; and communications problems stemming from incompatible message format and lack of connectivity between command elements impair real-time situational awareness.

Focused Dispatch. An emerging finding from the aviation portion of Focused Dispatch (FD) was that the participating commander chose imagery over battle graphics to control maneuver and fires. The Joint Surveillance Targeting Radar System (J-STARS) moving target indicator (MTI) representations of the forces-in-contact were judged superior to maps with unit symbols indicating center of mass of the forces.

The requirement to remain fully conscious of available combat power suggests that the commander wants to know the location of each aircraft at his command. A Fire Control Radar (FCR) image of the targets available from a given battle position along with location data on aircraft would have been regarded as ideal. A requirement to downlink J-STARS imagery to maneuver elements was identified to aid precision targeting of indirect fires. This finding does not negate the usefulness of a common picture for either planning or anticipation of future actions. It simply suggests that a combination of big picture and detailed picture is necessary for command.

Focused Dispatch obtained data on mission planning times employing the aviation mission planning system (AMPS). Uniform player opinion was that AMPS improved the quality of the planning product and saved time normally spent in duplicating overlays, nevertheless, no significant compression of the planning cycle was noted. This issue was found to be confounded in FD by the fact that current doctrine allows specific amounts of time for planning and that the quantity of preparation of mission graphics to be done by higher echelons of command has not yet been clarified.

FD demonstrated the capability of a command and control UH-60 (mock up of the A^2C^2S) with a real-time datalink to J-STARS MTI data to precisely maneuver attack battalions to optimized engagement areas and to control the tempo of the attack. Software was used to populate the FD virtual battlefield with the equivalent of a corps sized threat force. A J-STARS Exploitation (JSX) workstation and associated software encoded simulated moving battlefield entities into an MTI image displayable in the A^2C^2S. This picture of the battlefield was used extensively by the commander to precisely control the location and tempo of the attack since both the position of moving mechanized forces and attack helicopters was inferable.

Two other experiments; the Joint Precision Strike Demonstration (JPSD) and AWE Warrior Focus have just recently concluded. As emerging results are gathered from these exercises, these lessons learned will be incorporated into preparation end execution of the FY 96 experiments, leading to execution of the capstone event, the TF XXI exercise in February 1997. Through the Force XXI process of experimentation, Army Aviation will transform its doctrine, organizations, training, leader development, and materiel to take advantage of the technology of the information age. When combined with a world class aviation soldier, Army Aviation Aviation is the relevant force for the 21st century providing combat, combat support and combat service support capabilities across the spectrum of full-dimensional operations.

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COL Danielson is Chief of the Aviation Battle Lab Support Team (ABLST). MAJ Carter is Deputy Chief of ABLST.

BY COL DAVE AHEARN
and LTC JASON MARTIN

HARNESSING TOMORROW'S TECHNOLOGY TODAY

How the Directorate of Combat Developments ensures future battlefield success.

Fighting on the Twentieth Century battlefield will be tough! The myriad of advanced weapons systems fielded by both friendly and hostile nations boggles the mind.

The mission of the Directorate of Combat Developments is to ensure that Army Aviation maintains a modern and effective warfighting capability by developing operational concepts, organization and force design, and materiel system requirements which support the total force and enable the individual aviator to survive and win on the future battlefield.

The directorate's six divisions are organized to maximize the development of these systems into the Modernization and Technology Office, and the Organization and Force Development, Logistics Support, Materiel Support, and Concepts/Studies Divisions. The Directorate of Combat Developments is joined by the Integration Office for the OH-58D and the TRADOC System Managers for both the Apache Longbow and the Comanche in providing guidance and direction for these particularly important programs.

The Modernization and Technology Office provides oversight to the Science and Technology (S&T) program. This key developmental program provides the research and development underpinnings for technology insertion and aircraft/avionics integration programs necessary to maintain our combat superiority on future battlefields. It develops the foundation for system upgrades and for next generation future systems. The accelerating pace of technological change will continue to offer significant opportunities. High technology research and development is, and will remain, a central feature of Aviation's modernization strategy.

The Aviation S&T program addresses flight controls, structures, drive trains and propulsion, logistics, weapons integration, aircrew-aircraft integration, mission equipment, survivability, and advanced concepts for future rotorcraft. Key to establishing viable exit criteria for these programs are specifically defined demonstrations. These demonstrations range from Technology Demonstrations (TDs)

and Advanced Technology Demonstrations (ATDs), which confirm the feasibility or practicality of an emerging technology for solving specific military deficiencies, to Advanced Concept Technology Demonstrations (ACTD), which demonstrate an emerging military capability based upon maturing advanced technology in an operational setting. The S&T strategy drives the development of future technology insertions, aviation systems, and dual use technologies for the nation's rotorcraft. The payoff will be an aviation force with the technological superiority to dominate future conflicts.

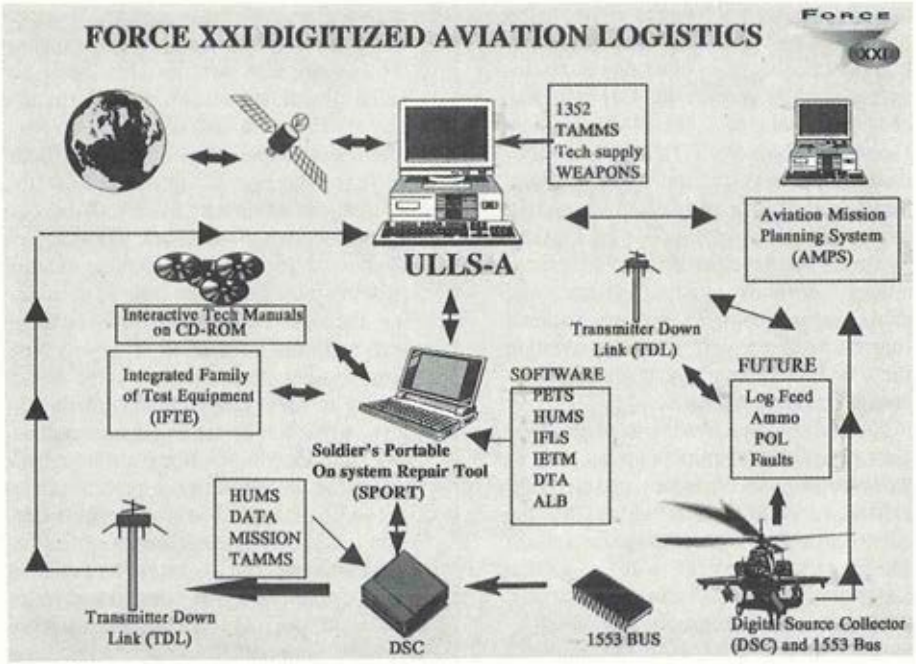
The Materiel Systems Division develops aircraft specific requirements as well as those for avionics, visionics, and electronic warfare systems. Starting in 2002 the current Aircraft Survivability Equipment (ASE) will be replaced with equipment capable of defeating advanced threats. The current radio frequency (RF) countermeasures equipment is being replaced with the Suite of Integrated RF Countermeasures (SIRFC). The SIRFC consists of advanced radar warning, advanced radar jamming and advanced airborne RF expendables. The SIRFC provides greater detection, warning, jamming, and chaff capability than currently available.

At about the same time the current Infrared (IR) countermeasures systems will be replaced with the new Suite of Integrated IR Countermeasures (SIIRCM). The SIIRCM consists of ultraviolet missile plume detectors, an IR tracking head with a directed jamming output, an improved countermeasures dispenser, and advanced flare expendables.

These suites provide detection of in-flight missiles and determine the proper countermeasures: RF and/or IR jamming, RF chaff, and/or IR flare. These two systems will be integrated into the aircraft as one system and be accessed through the existing aircraft display(s). The detection and target acquisition capability of the system provides the crew with detailed situational awareness information about RF threats and all missile activity. The Special Operations Forces (SOF) aircraft are the first aircraft to receive this equipment. Followed by installation on Longbow Apaches, Black Hawks, and Chinooks. The focus for shaping aviation systems must be on the future, considering the time required to fund, develop, test, and field a modified or new system. New systems and concepts must be designed to meet the challenges of the future, while forecasting and incorporating available technological advances to field a state of the art design.

The Logistics and Soldier Systems Division (LSSD) in the Directorate of Combat Developments (DCD) serves as the Combat Developers' agency and users' representative for U. S. Army Aviation Ground Support Equipment (AGSE) and Aviation Life Support Equipment (ALSE). LSSD also acts as the life cycle monitor of fielded AGSE and ALSE systems and is USAAVNC's subject matter expert on these systems. The Division is organized into two branches, the Logistics Branch (AGSE and aviation log issues) and the Survivability Branch (ALSE and soldier systems issues).

The Logistics Branch is currently conducting its annual AGSE Management Board. This board is held annually to validate requirements and prioritize programs for budgeting and fielding. This year's board is being handled differently from previous boards in that users from the field units have been invited. This is an important new development because user input to both combat and materiel developers is essential to the fielding of effective and useful systems in Aviation units. Currently, the Logistics Branch has



20 projects in AGSE including Advanced Aviation Forward Area Refueling System, Non-Destructive Test Equipment, Flexible Engine Diagnostic System, Generic Aircraft Nitrogen Generator, Unit Level Logistics System-Aviation, New Aircraft Tool System, and the Standard Aircraft Towing System. The branch also has Mission Needs Statements (MNS) sent forward for approval on Digitized Aviation Logistics and an AVIM Containerization and Modernization Program.

The Survivability Branch handles all ALSE and soldier systems issues and is currently working projects such as the Cockpit Airbag System, Joint Services Lightweight Integrated Suit Technology, XM-45 and XM-48 Protective Masks, HGU-56P Common Helmet, and the Lightweight Global Positioning System.

The Survivability Branch has recently received approval of their MNS for the Air Warrior Program, which parallels development of the Land Warrior (Infantry School) and Mounted Warrior (Armor School) programs. It is designed to produce an integrated, tailorable, and modular system of ALSE and survival gear that will take our aviation crew members into the 21st Century. Fielding of the objective system is expected in 2003.

One issue currently being addressed by the DCD at Fort Rucker in the Concepts/Studies Division is the future requirements for the medium/heavy lift cargo fleet.

The CH-47 fleet has served the Army well through many campaigns starting with Vietnam. We have modified the airframe over the last thirty-three years to its current "D" model configuration to meet our changing requirements. In the year 2002 the airframes will begin reaching 40 years of age. Increasing operating

and sustainment costs can be correlated directly to the age of the airframe. Load requirements continue to grow and modifications have added weight to the airframe, reducing useful payload.

The objective solution to our cargo fleet requirements is envisioned as the Joint Transport Rotorcraft (JTR). The JTR concept has been identified as the joint service medium/heavy transport replacement aircraft for the Army, Navy, Air Force, and Marines. Based on the replacement requirements for the armed forces existing medium/heavy lift aircraft fleets and current fiscal constraints, the JTR is envisioned around 2015.

Constantly increasing operating and sustainment costs, the questionable ability to meet future lift requirements, and the timing of the expected fielding of the JTR lead to an assessment of potential cost saving, capability enhancing, service life extending measures for the CH-47 fleet. A service life extension program, dubbed the Improved Cargo Helicopter (ICH) program, is being developed to provide a cost effective bridging of the gap between our current fleet and the JTR.

The Kiowa Warrior Integration Office has been following the progress of the 2/1 CAV at Ft Hood, TX, who will be participating in Force XXI. The 2/1 CAV is comprised of 16 OH-58D aircraft; 8 of which will be fully modified for the training plan (all of them will have some upgrades). The fully modified aircraft will have the following digitized systems:

- **Embedded Global Positioning System (GPS) in an Inertial Navigation System (EGI).** The EGI replaces the current Doppler/Attitude Heading Reference System (AHRS) combination and provides increased navigation accuracy (16m with GPS) and GPS timing data.
- **Improved Master Controller Processor Unit (IMCPU).** A left and right IMCPU replaces the left and right MCPU and the Integrated System Processor (ISP) of the current KW. The IMCPU provides a new digital map display on the Multifunction Display (MFD). The IMCPU also provides the processing power and memory necessary for integration of the other aircraft upgrades.
- **Improved Data Modem (IDM).** The IDM is the KW's link to the Task Force XXI digital battlefield. It replaces the Airborne Target Handover System (ATHS) of the existing KW and allows digital data to be transferred over the FM1, FM2, UHF, and VHF-AM radios using either TACFIRE or Version 3.0 Variable Message Format (VMF) messages. VMF is a new message format that will standardize the message sets used by both air and ground forces in the Task Force XXI exercise.
- **Single Channel Ground and Airborne Radio System (SINCGARS) System Improvement Program (SIP) Radio.** The SINCGARS SIP replaces the FM1 and FM2 radios and the associated Data Rate Adapters (DRA) and COMSEC devices in the current KW. The SINCGARS SIP radio provides faster data communication in a jamming or high noise environment.
- **Video Image Crosslink (VIXL).** VIXL provides the KW with the capability to send and receive still frame images over one of the FM radios. The VIXL consists of a circuit card installed in the IMCPU. The KW Project Manager's Office is developing software to support four VIXL ground stations which consist of an Aviation Mission Planning Station (AMPS) with a Tactical Communication Interface Module (TCIM) and a SINCGARS radio. The ground stations will be used to transfer VIXL images on the ground.
- **Improved Mast-Mounted-Sight System Processor (IMSP).** The IMSP is a direct replacement for the existing MSP

in the KW. The IMSP provides enhanced targeting through:

- Improved tracking lock-on and reacquisition
- Multi-target Track — Tracks up to six targets simultaneously
- Television (TV)/Thermal Image Sensors (TIS) split screen — Provides TV and TIS images on the same display page
- Auto Cue — Detects and highlight moving targets

As Army Aviation transitions into the 21st century, the TRADOC System Manager - Apache Longbow (TSM-LB) has been ensuring the Longbow Apache stands ready to deploy and fight anytime, anywhere, in adverse weather, and on the obscured battlefield. The Army's newest and most lethal attack helicopter was formally added to the Army arsenal on 18 October 1995, with a Defense Acquisition Board approval to go to full rate production. This decision will integrate the attack helicopter into the digitized battlespace of tomorrow. The modernization plan for the AH-64D consists of upgrading the current AH-64A fleet to the AH-64D configuration. Of the total, 227 will be equipped with the Longbow Fire Control Radar (FCR). This will provide both contingency and "First to Fight" units with a lethal, technologically superior heavy attack helicopter. The objective heavy attack unit design will consist of 24 AH-64D aircraft — nine with the FCR.

Prior to achieving these objectives, near to mid term materiel changes are applied to the AH-64A fleet to correct Operation DESERT STORM deficiencies and to incorporate necessary reliability and safety improvements. Some modifications include integrated GPS, a fire control computer (FCC) upgrade, High Frequency (HF) NOE Comms and SINCGARS, improved IFF, 30mm Gun RAM and accuracy improvements, target acquisition and pilotage system reliability and auto-tracking improvement. Completion of all modifications results in the AH-64A+ configuration. Remanufacturing of AH-64As will result in the AH--64D without FCR that will significantly enhance supportability, trainability and sustainability through fleet commonality.

The AH-64D with FCR configuration provides Unified CINCs with a superior heavy attack helicopter — one with unprecedented anti-armor and Suppression of Enemy Air Defenses (SEAD) lethality. The Longbow system consists of a mast-mounted millimeter wave FCR and a fire-and-forget RF Hellfire missile system. The mast-mounted assembly includes the FCR, and the AN/APR-48 Radar Frequency Interferometer antennas. The FCR rapidly detects, classifies, and prioritizes threat track, wheeled vehicles, air defense and aerial targets. The RFI detects and provides a precise azimuth to emitting radar threats and jammers. Correlated RFI and FCR data provides identification of emitting air defense units for immediate engagement and destruction. The RF Hellfire provides a true fire and forget capability in clear air, fog, blowing sand, and battlefield obscurants.

The first unit to be equipped with this devastating firepower is programmed to be the 1-227th Attack Helicopter Battalion at Ft Hood, TX. Initial fielding will begin as early as September of 1997 and continue through 2013. This timeline may shift to the left five years (fielding complete in 2008) pending implementation of a multi-year procurement plan. Regardless of its arrival timing, the Longbow Apache is the premier attack helicopter that will take us well into the next century.

On December 4, 1994, Secretary of Defense William Perry issued a memorandum that directed restructuring of the Comanche program. The program pro-

vides two flyable prototypes but defers production. The restructuring ensures that important advanced technology development of Comanche continues forward.

As a result of the Secretary of Defense's memorandum, the Army pursued alternatives to get Comanche into the hands of the User early. The Early Operational Concept strategy, approved on 28 February 1995, will provide the User six prototype aircraft configured to demonstrate advanced targeting, digital interoperability, supportability, survivability and simulated weapons firing as a portion of extended User operational evaluation.

Operational tactics, techniques, and procedures (TTP) will be developed and refined earlier than planned so when fielded this advanced integrated system may be fully utilized. These prototype aircraft will perform training, operational evaluation and reliability, diagnostics, and maintainability maturation for approximately 3800 flight hours. Initial training will take place at Fort Rucker.

First year operations will train the individual, collective and unit tasks necessary to accomplish the most significant combat deficiencies in the Army's most demanding mission area — Reconnaissance and Security. During these training periods assessment and refinement of crew coordination, team and troop tactics, techniques and procedures are planned. The unit will then be transferred to an operational installation for verification and further refinement of TTPs as developed from Force Development and Experimentation (FDTE) I and II (Crew and Team). They will participate in FDTE III (Unit) and potentially Combat Training Center rotations. These evaluations will culminate in limited user test (LUT) to provide the operational assessment for a Low Rate Initial Production decision.

After Mission Equipment Package updates, the EOC unit will participate in Initial Operational Test and Evaluation (IOTE) to assess full Comanche capabilities in a realistic battlefield environment. Subsequent exercises will assess Comanche's capability to perform scouting tasks for Apache Longbow in the Heavy Division Attack Battalion. Additionally, this complete effort allows earlier and increased involvement of soldier maintainers and supporters to evaluate the reliability, maintainability, and supportability of the system as well as reliability growth curve maturation. The first prototype rolled out of the factory on 25 May 1995 and is currently undergoing system tests in preparation for first flight.

The focus for shaping aviation systems must be on the future. This requires the Combat and Materiel Developers, along with Industry, to forecast and incorporate available technological advances in all new or modified systems.

The Organization/Force Development Division has been actively working on the Aviation Functional Area Assessment (FAA) and the Total Army Analysis (TAA) program. In any complex organization, like the Army, there is a periodic need to stop and assess the status of current and future programs in a "State of the Branch" manner. GEN Maxwell Thurman, while Vice Chief of Staff of the Army, established the FAA concept as a method to assess the readiness of the Army.

GEN Thurman's approach was straight forward and comprehensive. The FAA addresses each of the force development domains: Doctrine, Training, Leader Development, Organizations, Materiel and Soldiers. These domains are referred to as DTLOMS. By dividing the evaluation into these six key facets of force integration, GEN Thurman was able to accurately and efficiently assess the readiness of the Army and to gauge programmatic effects of future changes such as equipment modernization or doctrine changes.

On a biennial basis, each branch in the Army undergoes a self evaluation focusing on the six domains. The depth of analysis is determined by guidance from the Army Staff and the Branch Chief. Current and upcoming events such as unit redesigns or new equipment fielding serve as a start point. Assessing each of the domains against the current situation establishes the foundation for evaluation of future force integration issues.

The time frames considered in the analysis process are broken into near-term, Program Objective Memorandum (POM) years and Extended Procurement Plan (EPP) years. Near-term is normally defined as the current and next year. These two years are already in the execution phase with approved budgets and program timelines set. Major changes to near-term programs can be very difficult. The POM years begin where the budget is not yet final and continues out six more years. The POM is the official statement of programs with approved budget funding lines over a six year period. Since the FAA is a biennial process, it is sometimes appropriate to consider the POM plus two years as the POM years. The EPP covers relevant years beyond the POM. Once the self analysis is complete, each branch prepares a "State of the Branch" style briefing to the Chief of Staff of the Army.Managing change in the Army is one of the most challenging undertakings imaginable. TAA is the Army's change management technique. The TAA combines hundreds of interrelated and interactive events that determine the course to the future for the Army.

On a macro level, the TAA process resembles a traffic circle. At the center of the traffic circle is the Army's force structure. It takes the Army two years to move completely around the circle. Along the way are primary and secondary intersections that provide access to the world outside the circle and allow entry into the circle. The circle has no end and each trip around its course is different, having been modified by the events of the previous trip. Everything that happens in the traffic circle can effect the Army's force structure in the center of the circle.

Some of the important intersections around the circle include connections with the National Command Authority, Joint Chiefs of Staff, Department of Defense and connections with several of the federal budget processes. One type of intersection on the circle, the Force Design Update (FDU), occurs two times every year or four times every full TAA. The FDU is the mechanism for branches to make minor adjustments along the way where the changes provide incremental updates to the current approved force structure but do not effect the overall size and composition of the total force.

The main intersection on the circle is a series of conferences and briefings that culminate with a decision by the Chief of Staff of the Army on the Army's future size and composition. This decision briefing occurs in odd numbered years and determines the exact force structure at the end of the POM years. The decision is sometimes referred to by the end of the year of the POM. For example, the 1995 decision will be referred to as TAA-2005 (also TAA-05) because the end year of the POM is 2005. If no other changes occur, the TAA-05 decisions describe the force structure of the Army as it will exist at the end of fiscal year 2005. Of course, the process continues.

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COL Ahearn is Director, Director of Combat Developments (DCD), USAAVNC.

LTC Martin is Chief of the Administrative and Sustainment Office, DCD, USAAVNC.

BY MAJ STEVE EISENHART
and BILL HAYES

USAAVNC: A WORLD CLASS AVIATION TRAINING CENTER

Those who return to the Aviation Center after a time away cannot help but notice recent and on-going construction and improvements. A variety of projects have changed the face of the campus, several basefields, and even our family housing areas. But changes of greater significance are developing within the very fabric of the organization.

Developing a total Army Aviation Team and improving the quality of life.

A pro-active approach to managing the changes that shape the future of the Army's Aviation Branch, though not visible to casual observers, is pervasive throughout the "schoolhouse" at Forts Rucker and Eustis, as well as among the elements and tenant commands that comprise the Center Team.

In a "State of the Branch" address last March, MG Ronald E. Adams cited the Army leadership's vision and conscious choice for the Army to shape change rather than merely changing shape. "We have done so by leveraging information technology to advantage the Army's quality people and by redesigning the fighting forces and sustaining base to better support these forces," he said.

The Commander's Vision for our installation is a sound charter for developing a total Army Aviation Team, creating a world class aviation training facility and continuously improving the community and quality of life.

The challenge to the Aviation Center is not "to do more with less", but rather to do all necessary things with improved efficiency and greater surety, to meet or exceed performance standards, to scale down the overhead and volume with no compromise in qualifications or safety. The commander's intent for the Aviation Center is to:

- Seek Efficiencies
- Protect flight training and leader development
- Balance investment strategy
- Stabilize organizations
- Aggressively participate in Force XXI

The USAAVNC "Watchwords" support the Commander's installation vision and intent. And the quality work force maintains a steady focus with these words in mind.

USAAVNC WATCHWORDS

- SET, ENFORCE, MAINTAIN HIGH STANDARDS
- PROTECT THE FORCE - SAFETY
- TREAT EVERYONE WITH DIGNITY
- LEADERSHIP FOUNDED ON RESPECT
- REALISTIC, BATTLE FOCUSED TRAINING
- AIM CLEARLY ON THE FUTURE

In the face of an accelerating rate of change, the advantage goes to people and systems that can accelerate their adaptivity to outstrip the pace of events.

The choice to influence the future continues to drive Aviation Center efforts in the areas of doctrine, organization, training, leader development, materiel and soldiers (DOTLMS) as they relate to military operations across the spectrum.

Updates on specific initiatives and continuing programs are in related articles.

The focus of attention is on the products that come from the Center or that reach the field through Aviation Center participation.

Those "products" include the young soldiers who graduate from initial-entry training, the mid-career graduates from aircraft qualification and professional development courses, and those selected for pre-command and other advanced training.

They, through their performance, reflect on the relevance and timeliness of the instruction they receive in the classrooms, the cockpits, the simulators, on the firing range and in the field training exercises. Their daily efforts reflect how well the training institutions have imbued them with the warrior spirit, the professional ethic, tactical and technical proficiency, and safety consciousness.

Other products include the doctrinal and training literature and how well that body incorporates the lessons learned during diverse exercises and operations.

Likewise, new systems, enhancements and force structures coming to aviation units now and into the next century will influence their efficiency and effectiveness for the next decade or more.

Just as important are the ways and means by which units will affect their transitions to new tables of organization and equipment, and share that experience with other units that will transition later.

Comanche remains the Army's cornerstone system for the next century as test flights begin at West Palm Beach for the demonstration/validation program. The Early Operational Capability unit continues refining the tactics, techniques and procedures for Comanche. Unit members are also the Comanche warfighters for each Advanced Warfighting Experiment that includes Comanche to ensure current doctrine and full system capabilities are represented.

In August, they received the Comanche Player Station, a virtual simulator that allows us to realistically demonstrate Comanche and Army Aviation capabilities in combined arms and joint exercises.

TRADOC System Managers here continue their work to ensure that Comanche and Apache Longbow meet the needs of our Army, our commanders, aircrews, and maintainers.

Realignment and consolidation of enlisted maintenance MOSs, along with formalized postgraduate training, are designed to provide commanders young soldiers and NCOs with technical skills needed on the flightline and in the shops for a smaller fleet of increasingly sophisticated aircraft.

The maintenance manager and maintenance test pilot training, now fully transferred from Fort Eustis, is conducted at a new facility at Knox Army Heliport. They made the jump from Cairns to Knox last summer without breaking stride in the training.

Leader development and skills training are focused to prepare aviation soldiers to fight as members of the Army's Force XXI plan and structures.

The Aviation Force XXI Campaign Plan includes our part in the Advanced Warfighting Experiments over the next two years. Distributed Interactive Simulation allows individual and unit participation in exercises up to theater level, including full combined arms and joint service players.

To ensure effective exploitation of simulation technology in the face of constrained resources, the Directorate of Training, Doctrine and Simulation's simulation strategy consolidates simulation requirements.

The Aviation Combined Arms Tactical Trainer, along with constructive and live simulations, will enable commanders to exercise with multiple employment, diverse environments and emerging modular force structures.

The Warfighting Simulation Center here allows young leaders to develop their skills in situational awareness and battle synchronization.

The Army Research Institute team here continues the research and development project through the Simulation Training Advanced Testbed for Aviation (STRATA). By using reconfigurable devices to emulate a variety of aircraft, the system shows potential to keep pace with developing simulation technology while keeping costs of capital investment down.Aviation Training Brigade also reduced costs of primary flight training by bringing more of the TH-67 fleet onto the flightline, and holding flying hour costs a little above $200 per hour.

Aviation brigade commanders throughout the Army have completed a banner year, holding the Class A accident rate below 1 per 100,000 flight hours for the first time in history. And they accomplished this in the face of demanding missions in diverse environments.

The mark was made by virtue of good decisions by competent leaders communicating their intentions and expectations in no uncertain terms, and in a timely manner.

The continuing cycle of decision, action and assessment depends on timely interaction among elements of the Force, and in particular upon feedback from the units whose members work the system every day. In its many forms, field input fuels the engine that drives initiative change.

The reports, the comments on coordinating drafts, the articles in professional publications, the comments from commanders during conferences such as the Brigade Commanders Conference -- all are part of the cybernetic loop that fuels initiative, evolution, adaptation and improvements.

"In its many forms, field input fuels the engine that drives initiative change."

Not the least of the feedback channels, though certainly the newest, is the Deficiency Analysis Branch within the Directorate of Training, Doctrine and Simulation. It provides a means for the orderly and continuous fine-tuning of the Army Aviation system, particularly through input from brigade commanders and the combat training centers.

Serving as a clearing house, members of this small team use available "high speed" media to gather, assess, channel and track DOTLMS deficiencies, and to close the loop with the originator by providing a response regarding completed actions.

Just as digitized communication technologies provide battlefield commanders the leverage to win the information war, they also provide the sustaining institutions the means to win the resource battles they face.

More often than not, myriad actions and information move throughout the Aviation Center and the Branch faster than ever before through digital information systems. Increasingly, messages, action memos and published articles include FAX and E-mail point of contact as well as phone numbers and addresses.

Informal communications move with the speed of light. Flashing past the paper communications and shoe leather delivery of recent years.

Cyberlinks provide organizations the means of quicker coordination and improved agility to match the pace of emerging change in the Army and the world.

Thoughtful leaders need only to follow developments through today's news to appreciate the significance of world events and understand the implications for Aviation's capabilities and versatility.

The Aviation Center and Branch are accelerating the pace of action to meet the challenges we face. The leaders in the field are doing no less to accomplish their tasks and their units' missions. It remains for all members of the Army Aviation team to get on with it.

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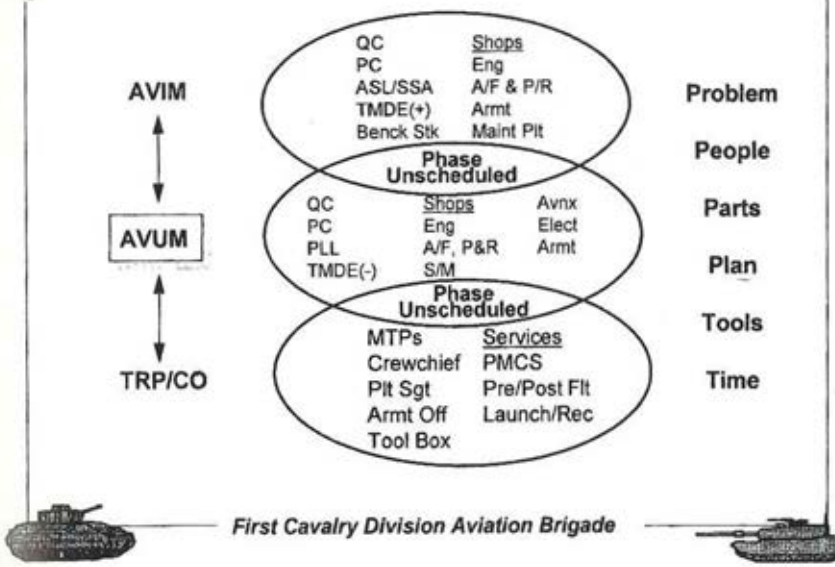
MAJ Eisenhart is the Public Affairs Officer, USAAVNC, Ft. Rucker, AL.

Mr. Hayes is the Public Information Chief, USAAVNC, Ft. Rucker, AL.



1ST CAV

(Continued from Page 24)

holding people accountable for their maintenance status as a performance indicator are keys to gaining and maintaining the proper focus on readiness. Numbers are not emphasized in a vacuum. Aircraft readiness is judged by how many sustained troop and company battle drills a unit, AVUM, and AVIM can support, not just aircraft hours flown and FMC rates. Without the proactive involvement of commanders at every level, we will not be ready to deploy as part of a 911, heavy division. Therefore, every aviation leader needs to understand where they play in the division's aviation maintenance formation. The attached schematic depicts the three levels of aviation maintenance. The circles overlap for a reason — it is those overlapped areas where the P4T2 decisions are critical, and need the visibility of the AVIM and AVUM commanders. Company and Troop Commanders are responsible for the aircraft log book, the aircraft status, and the timely reporting of all aircraft faults. Crew members play a major role in the sustainment of our aircraft. The proper preflight/postflight is the analysis of the Problem, and is the first step in initiating the P4T2 process. The exchange of aircraft status between the Troop/Company-AVUM-AVIM has to be done at a minimum once a day to ensure the factor of P4T2, division-wide, are constantly updated.

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COL Cody is the Commander, 1st Cavalry Brigade, Fort Hood, TX.

BY BURTON WRIGHT III, Ph.D.

HOW DID WE KEEP 'EM FLYING?

The logistics story of Operations DESERT SHIELD and DESERT STORM.

During and after the Persian Gulf War, the overwhelming success of the U.S. armed services was proclaimed in print and on television. As a result, many Army Aviation units and flight crews were accorded special attention and praise, and deservedly so. While a high level of professionalism was certainly one reason for the great performance of Army Aviation during the conflict, several equally important reasons were overlooked.

Also deserving a big pat on the back were people who fired no weapons and destroyed no targets. These unsung heroes were armed only with tools and an overwhelming drive to ensure that the combat personnel who manned the aircraft flew with all systems operational. But Army Aviation mechanics and maintenance personnel could never have performed their jobs without the extraordinary logistics support available both within Southwest Asia and from the Continental United States (CONUS).

The mechanics may have repaired the aircraft, but the parts they used to "keep 'em flying" came to them as the result of a sometimes jury-rigged system. Without the parts this system supplied, mechanics would have been as useless as deadlined aircraft. Without parts, no repairs could have been performed, and without repairs, no aircraft could have flown for very long. Without the aircraft, DESERT STORM would have been much more costly in lives and equipment.

Operation DESERT SHIELD — Aviation Units Arrive. Although many of the aviation units deployed to Southwest Asia had previously spent time at the National Training Center at Ft. Irwin, CA, the problems of living, flying, and maintaining in the Saudi Arabian desert called for new thinking and many adjustments.

It was a whole new ball game, one in which ensuring that all necessary parts were packed for shipment was as important as training for combat. Some aviation units never did receive the first Authorized Stockage List (ASL) replenishment because Class IX (repair parts) did not have a high priority in the logistics sys-

tem. Why? Because there was no particular reason to give high-priority cargo space to aviation parts; besides, aircraft should not need *that* many replacement parts, or so some thought. As the load lists were being prepared, that was probably true enough, but no one had factored in the extremes of temperature and terrain of the Saudi desert.

Desert Problems—Heat and Sand. One of our favorite summer pastimes in the United States is going to the seashore and playing on sandy beaches. There, the sand causes no problems. When ingested into aircraft engines, and blasted against metal surfaces at high speeds and great heat, however, sand becomes a very unpleasant problem for aircraft maintainers.

Upon arriving, aviation units assembled their aircraft and flew missions over the Saudi desert. It wasn't long before sand got the attention of the maintainers. Rotor blades melted under assault by Saudi sand. Aircraft windows cracked. Engines scheduled for 1,500 hours of operation before major overhaul were lasting only 50 hours.

The parts brought by aviation units to the desert disappeared faster than planned. The National Training Center was never like this. A certain amount of desperation began to creep into the minds of aviation commanders. How long could their aircraft keep flying?

You Can't Take It All With You. When units prepared for deployment to Saudi Arabia, they were limited in what they could bring with them by factors outside of their control. They had to decide whether to bring ammunition or their Prescribed Load List (PLL). Some units chose to bring half of each, and some opted for all of one or all of the other. No one really solved this dilemma.

Everyone suddenly needed parts, enclosed areas in which to repair and maintain aircraft, and hardstands for landing aircraft. These items were in short supply in CONUS, let alone the desert. Although Saudi Arabia had built air bases for a contingency like Operation DESERT SHIELD and made them available for U.S. use, the numbers of U.S. Air Force and Army aircraft arriving in the theater too soon forced Army rotary wing maintenance operations into the open desert.

During Operations DESERT SHIELD and DESERT STORM, Army Aviation units possessed no magic wand that they could wave to make parts appear. It was an old story. Lack of parts had plagued operations during World War II, Korea, and Vietnam. If nothing was done during the early weeks of DESERT SHIELD to alleviate the continuing shortage of parts, Army Aviation—a cornerstone of defensive operations in Saudi Arabia—would shut down and put thousands of "grunts" in the Saudi desert at considerable risk. By anyone's definition, a crisis was approaching.

DHL to the Rescue. The Army found that packages could be quickly delivered from anywhere in the world to locations in Saudi Arabia. The principal company providing that service was DHL. So the Army turned to that organization to get desperately needed parts fast to aviation units in Southwest Asia. The cost was enormous, but the possible lack of aviation support in battle overrode cost considerations. Again, the use of private courier companies was not new. The concept had been used numerous times in Alaska when parts were urgently needed.

A very expensive and somewhat tenuous lifeline for critical parts had now been set up. Other private package haulers were also used, and the crisis temporarily abated. But it was not over.

The Rise of Desert Express. After DHL and similar organizations had pro-

vided a way to keep aircraft flying, the head of the Air Force's Military Airlift Command (MAC) approached Army representatives with a proposition that went something like this:

MAC General: If I provide a daily dedicated C-141 to move supplies from CONUS to Southwest Asia, would you stop using DHL to ship your parts?

Army: Are you kidding? Sure!

Beginning on 20 October 1990, a C-141 left every day from Charleston Air Force Base, SC, for Southwest Asia. Army Aviation was allocated five pallet positions on each flight. A representative of the Army Aviation Systems Command (AVSCOM), St. Louis, MO was always on site at Charleston to oversee the loading of the aviation pallets.

A reliable and cost-effective way to get critical parts to where they were needed most was now in place, but the circle hadn't yet been closed. Other problems had arisen that could not always be solved by units on the spot, such as the lack of critical parts in the supply system. Like the cavalry riding to the rescue, AVSCOM stepped into the fray to do its job and much, much more.

When the final history of Operations DESERT SHIELD and DESERT STORM is written, the work of AVSCOM should be accorded a place of honor. The importance of this organization in keeping Army Aviation flying should not be underestimated.

Commanded by MG Donald R. Williamson, AVSCOM began a high-tempo operation to accomplish two very critical tasks in the aviation parts supply chain: get manufacturers to create the parts faster than they had ever done before, and then get the parts to the daily Desert Express flight. Both were accomplished in record time but not without a lot of hard work and lack of sleep.

MG Williamson and his staff began calling and visiting parts suppliers. Using a mix of critical need and forceful persuasion, the general got fabricators of aircraft parts to speed up the process. Actually, the manufacturers needed little prompting. A phone call obtained their help, and parts began to flow in increasing numbers.

No one city in the United States manufactured all of the necessary parts. The factories were scattered across the country. Some way had to be found to pick up the parts and get them to the Desert Express plane. Army National Guard and Army Reserve air units offered their support, and used fixed-wing assets (primarily C-12s) to fly to cities all over the country to pick up critical parts and take them to Charleston AFB for shipment.

Some of the needed parts were stored at Army depots, so the aircraft had to make a number of stops to get all the parts needed on any particular run. Gradually, everything came together, and the most parts began to flow to where they were needed most. But in developing this Desert Express system, a problem was created at the user end: What part went where, and whose was it?

AOG: The Right Part for the Right Unit. Let's say that the 2d Battalion, 229th Aviation Regiment, needed an auxiliary power unit for one of its UH-60 Black Hawk helicopters. It notified the appropriate authorities in CONUS through normal supply channels, and the part was put into the Desert Express system.

Twenty-four hours later the part would show up in Saudi Arabia. But unless there was a way to identify it, the part might end up with a lift battalion or an air cavalry squadron that had not requested the part. Since the receiving unit might find the part useful, it would keep it and

not put it back into the system for shipment to the original addressee. By that time, tracking down the critical part was next to impossible. What to do?

AVSCOM developed an efficient system that not only identified the most critical parts but also tracked them to ensure that they arrived at the requesting unit and no place else. This system was christened Aircraft on the Ground (AOG).

Under AOG, the part was marked with a particularly colorful florescent tag that identified it, at any distance, as a critical aviation part. Since parts constituted only a small portion of huge logistics shipments, the ability to spot them among the pallet loads of other equipment, or within a pallet load, was extremely important.

The name of the unit needing the part was entered on the tag. The part then went straight to where it was needed. AVSCOM did more than just push parts up the system; its expertise in aviation systems was used to solve serious maintenance problems that cropped up every day.

AVSCOM to the Rescue. AVSCOM was established to provide systems for Army Aviation and expertise on how to maintain and fix those systems. As aviation systems fielded by the Army have become more and more complex, AVSCOM's responsibilities grew at the same rate. When things went wrong in the desert and defied a maintenance solution, maintenance personnel looked to AVSCOM for advice and help.

There was no lack of mechanical problems in the desert. Many problems with aircraft systems resulted from the extremes of the environment in Saudi Arabia and could not be fixed by parts alone. Using in-house expertise and contacts with manufacturers experienced in desert flight operations, AVSCOM personnel worked around the clock to come up with potential fixes.

When sand wore rotor blades down to dangerous levels, AVSCOM expedited the novel solution of using special tape to help prolong blade usefulness. AVSCOM also imported another "quick-fix" solution by having crew chiefs coat rotor blades with special spray paint every time they flew. After that, it was not uncommon to see crew chiefs get out of helicopters armed with a spray can of paint and spray the leading edges of the blades before their aircraft took off again. The sand normally blasted off the coating of paint while the aircraft was in flight, so a fresh coat would be required when the aircraft landed. These were not permanent fixes, but they worked.

Special teams were set up to study critical mechanical problems and find quick-fix solutions in the shortest possible time. For example, particle separator kits were developed for certain helicopter models and shipped to Southwest Asia. They proved very helpful in prolonging the life of valuable aircraft engines.

The Parts Bazaar. Units in Saudi Arabia did their part to maximize what was already available in the supply system. Units embraced an age-old solution: an aviation parts bazaar where parts were swapped and traded with all the fervor of an Arab *souk* (market). Supply and maintenance officers have used this expedient for decades. In the desert, Army aviation took the practice to a new level. The parts bazaar began as a simple meeting involving just a few key people, but it soon grew and grew.

The Friday Maintenance Meeting. The first units deployed to Saudi Arabia used fixed installations to prepare for their missions. One fixed installation used throughout the war was the King Fahd International Airport, where many of the

first Army aviation units to arrive were based.

Almost from the first day, parts were a real problem. One evening, as it grew dark, two aviation brigade commanders sat down on boxes outside the hangar where many of their personnel were sleeping. In talking out the parts problem, they happened onto a very old solution.

In centuries past, military organizations managed to get the equipment or other support they needed by barter. If you had an overage of one item and needed another, you offered to trade that overage to get what you didn't have. The system worked before; in Saudi Arabia, it gave birth to the Friday maintenance meeting.

The meeting originally involved only units from the XVIII Airborne Corps and their attached organizations. It was usually chaired by the Army Central Command (ARCENT) aviation officer, COL Richard Roy, and it had no fixed agenda. Parts problems were the immediate object of the conversation, and any available information on the current situation was shared. The meeting would then be opened for comments and requests from the floor.

Maintenance officers from units needing assistance would describe what they needed, and others, who had the needed parts, would say that they could assist, and the two would get together. Word of this meeting quickly made the rounds of arriving aviation units (including echelons above corps and VII Corps units), and they also came.

Shortly before Operation DESERT STORM commenced, several hundred people were crowding into an auditorium at the King Fahd airport once a week to talk and, more importantly, trade. Such cross-leveling and swapping paid big dividends as aviation units were able to maintain high availability rates as they prepared for combat.

The development of a functioning parts system was as critical to victory in the desert as any other factor. This was especially true for Army aviation units. During the train-up and the execution of DESERT STORM, Army Aviation units maintained readiness levels of 90% or more. This would never have been possible without AVSCOM, the Friday maintenance meeting, the AOG system, Desert Express, and other flexible and innovative ideas conceived and executed during the conflict.

Without the high readiness rates attained before the battle, casualties would have been greater and victory longer in coming. We would have won the war, but our victory would have cost more than necessary. The time and effort taken in both CONUS and Southwest Asia to develop a functioning parts system paid off in battle, as it always will. There are important lessons for the future here.

There will be those, of course, who assume that everything went well in the desert and ascribe the victory solely to three factors: military personnel, training, and weapon systems. All were significant factors in our success, of course, but we must not overlook the importance of parts. In the future, the necessary stockpiles of critical parts may not be maintained because of a shrinking defense dollar. That would be pound-foolish, not penny-wise.

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Mr. Wright is the Staff Historian, U.S. Army Aviation Center (USAAVNC), Ft. Rucker, AL. *This article first appeared in the November-December 1995 issue of the* ARMY LOGISTICIAN.

BY CPT DAVID C. ORTEGA

THE AIRBORNE ENGINEERING EVALUATION SUPPORT BRANCH

Testing and evaluating tomorrow's aviation technology.

The Airborne Engineering Evaluation Support Branch (AEESB) is located at the Naval Air Engineering Station, Lakehurst, NJ. AEESB is a branch of the Command, Control and Systems Integration Directorate that falls under the Research Development and Engineering Center (RDEC) for the Communications-Electronics Command (CECOM) at Ft. Monmouth, NJ.

Like CECOM, AEESB's mission focus is on the "Bottom Line: The Soldier." AEESB provides aviation platforms for the evaluation and testing of communication, navigation, electronic combat, and counter-electronic combat for the RDEC, CECOM, and the Army Materiel Command (AMC). The AEESB is integrally involved in supporting the accomplishment of many of the Army Chief of Staff's modernization objectives to include: dominating maneuver, protecting the force, executing precision strikes, and winning the information war.

The roots of the AEESB date back to 1918 when hangars and airfields were first constructed to support the newly formed Radio Laboratories on what is now Ft. Monmouth. The organization's mission and size have varied over time, but its workers' dedication to the fighting troops has never waned.

AEESB's present mission is to provide aviation support for research development and evaluation of airborne electronics systems of CECOM, and other AMC and Department of Defense (DOD) activities.

This is accomplished by having on hand trained pilots and aircraft platforms for R&D support, technically skilled personnel at installation, prototyping, production of one-of-a-kind or quick-response systems, and providing timely aviation facility flight line services including AVIM under Army Regulation 5-9 intraservice agreements. The AEESB also has a detachment in Ft. Belvoir, VA that supports night vision technology evaluation and engineering support.

The night vision detachment specializes in owning the night and seeing deep into the battlefield. Presently the night vision detachment is testing an airborne hyper

spectral imager that uses breakthrough technology in hyper spectral imaging to detect and discriminate camouflage paints against natural foliage. Potential uses for this on the modern battlefield include aerial reconnaissance utilization in helicopters, fixed-wing aircraft, and UAVs. The detachment has specially configured a JAH-1S Cobra, in which it has tested numerous aided flight systems. Presently the detachment is preparing to test a binocular view helmet mounted display. This display will work in conjunction with the flat panel display and other pilot aiding systems for potential fielding in the Comanche and other future helicopter systems.

The detachment was instrumental in bringing Forward Looking Infrared (FLIR) vision to aviation, and is now using a JUH-1H test bed to evaluate a partial overlap binocular field-of-view (FOV). This test focuses on determining the effects of partial overlap FOV on flight performance as compared to fully overlapped FOV, and will assist in determining the best night vision system for a pilot while balancing work load with the increased cockpit requirements of operating under a night vision system in the terrain flight mode.

The AEESB has been critical in supporting aviation battlefield enhancements. Although global positioning system (GPS) began to be first fielded in the Army in 1989, GPS's contribution to the aviator's mission planning and navigation were uncertain at that time. AEESB was instrumental in overcoming this uncertainty. The AEESB manufactures, packages, and distributes GPS installation kits to the front-line combat aviation units world-wide. The GPS kit is an independently designed mounting, antenna, and power harness kit designed for each rotary wing aircraft type. The kit puts GPS at the pilot's fingertips, thereby reducing pilot workload and providing an accurate and timely assistant for battlefield navigation. AEESB frequently sends quality assurance teams to assist in the kit installation, and to ensure the installers and maintainers are trained and functional at kit installation. AEESB has manufactured over 1,000 kits for the UH-1, OH-58, AH-1, and AH-64, with still over 1,000 kits expected to be fielded. AEESB works closely with the line aviators and design engineers to ensure the kit provides maximum visibility and usefulness while at the same time being electrically safe and crash-worthy.

In conjunction with the CECOM statement of "Bottom Line: The Soldier", AEESB is the lead activity in evaluating, and recommending an NDI commercial wireless interconnecting system (ICS) for use by rotary wing aircraft crew chiefs. The present long cable system is cumbersome and restricts mobility of the crew-chief, avionics technician, Forward Ammunition and Refueling Point (FARP) platoon sergeant, and others needing ground based communication with the helicopter air crew. The AEESB is currently testing systems that will allow someone on the ground to communicate over the aircraft ICS from up to 100 feet away from the aircraft without being bound to a wire. The final product could significantly increase safety as well as improve overall mission efficiency and crew coordination.

Command and control of the battlefield is critical. AEESB supports command and control of the battlefield with the manufacturing and installation of the 12 station interconnecting system (ICS). This modification kit provides 12 headset connections in a small lightweight package, that can be installed at the intermediate maintenance level. The 12 station ICS is fully

compatible with all the radio systems in a UH-60 to include FM, IFF, and SATCOM (satellite communication). This allows the commander to have immediate communication with up to ten other staff members while aboard a UH-60 aircraft. At present, 12 station ICS systems are deployed throughout the world to include Europe, Korea, and CONUS.

In supporting the CECOM RDEC, AEESB is instrumental in testing and evaluating many battlefield enhancement communication and navigation electronics. AEESB is the sole evaluator of the AN/ASN-128B Doppler/GPS Navigation Set. Tests to determine the accuracy and efficiency of the AN/ASN-128B with a two line display have been conducted over the pinelands, sand, and ocean terrain of New Jersey, to the hot and shifting sand of White Sands Missile Range, NM. This second generation Doppler/GPS Navigation Set has noted improvements: a two-line display element designed to comply with Army Tactical and National Air Space requirements, HAVE QUICK timing interface, and Doppler tracking while GPS is jammed or interfered.

Future tests are scheduled to be done over the next fiscal year to test a four line display that provides more information in adherence with Federal Aviation Regulations as well as being programmed in ADA which allows for more information to be stored and works toward compatibility to the MIL-STD-1553B data bus. The AN/ASN-128D will be compatible with the 1553B data bus and is scheduled to be fielded with the UH-60Q Black Hawk. This is a key system in supporting the digitization of the battlefield.

Because safety and life-saving equipment are always battlefield considerations, the testing of the Personnel Locator System (PLS) is a high visibility and important program. The new PLS allows the search aircraft to look for downed aircrew members in any weather and be able to positively identify the location and the identity of the downed aircrew member. The downed aircrew member's survival radio does not transmit until interrogated by the search aircraft and then only replies with an encoded 300 millisecond message burst. This system consists of two components: a survival radio and an aircraft mounted locator kit. The guidance kit can be mounted by the aircrew's unit in less than one hour, and replaces the Vietnam-era radio that was detectable by both the enemy and the search and rescue party.

Past successes have earned AEESB a quality name in the test and evaluation field. Successful flight evaluations and quick, precise system integrations have made AEESB a mainstay in the fielding of communications and navigation electronics for the fighting force. Presently AEESB contract team is producing various installation kits in accordance with military work orders. In addition to kit production for GPS, AEESB produces installation kits for the AN/ARC-199 high frequency radios, commercial GPS for IFR navigation, police frequency SABER installation in the AH-64, AN/ARN-149 kits for the AH-64A/B, SINCGARS for the UH-60, CH-47D, RAID OH-58 transponder modification, and the AN/APR-44(V)3 for the UH-60.

The winning combination of military personnel, DACs, and experienced contract personnel, successfully supports the complex integration and evaluation of electronic aviation systems for tomorrow's battlefield. AEESB prides itself on being a "one-stop shop" for new dimensions in aviation electronic research.

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CPT Ortega was the Air Operations Officer, AEESB, Ft. Monmouth, NJ when this article was written.

TRIUMPHANT
(Continued from Page 10)

advanced weaponry to anyone with hard cash. This situation is made even more worrisome by the ease with which older systems can be improved through purchases of "off-the-shelf" technology. As potential foes procure and upgrade sophisticated systems and harden and conceal command and control, launch, research and development, and storage sites, our military forces will have increasingly greater difficulty finding and striking them when required.

In devising a military strategy and associated campaign plans to contend with these threats, USCENTCOM must compensate for lines of communication that stretch more than 7000 miles from the United States. Potential adversaries, on the other hand, need only travel 100-150 miles to reach Kuwait and the Saudi oil fields. This time-distance problem is further aggravated by the absence of formal agreements and alliances with local states, the need to balance military requirements with cultural sensitivities, and the demands of having to fight, maintain, and communicate in some of the world's harshest climates and most rugged terrain.

To meet these trials, we at USCENTCOM engage in activities that satisfy near-term requirements and offer the basis for confronting long-term threats. A major foundation for these efforts is the strong relations forged with our regional friends over the years. We have been able to address with them our mutual security concerns while also gaining access to the region. It is this access that secures our interests and provides the operational capabilities needed to deploy and employ our military force. From this base, we pursue an array of initiatives that support our peace and wartime goals. We maintain a relatively small but lethal mix of air, ground, and sea forces forward in the Gulf and reinforce these with additional units and individuals participating in robust exercise and security assistance programs. To reduce deployment time-lines, we preposition sizeable stockpiles of supplies and equipment ashore throughout the region and augment these with other stocks afloat. While critical, activities in the region alone do not meet our security needs. Success in future conflicts requires that we be able to project power rapidly from the U.S. and elsewhere in the world. To meet this need, we routinely practice speedy mobilization and deployment of trained and ready units, people, and equipment. Through the cumulative effect of these activities, we promote regional peace and stability, deter hostilities, limit the intensity of conflict should deterrence fail, and fight and win wars when required.

While we seek to employ these measures to deter conflict by convincing would-be aggressors of the futility of using force to achieve hostile aims, we recognize that our success requires being able to fight and win on the battlefield. In such circumstances, we expect U.S. forces operating in the complex strategic environment of the Central Region to be adept at waging high-intensity warfare with coalition partners. Units and leaders that can meet this operational challenge possess the flexibility and versatility to handle threats spanning the conflict continuum.

In this context, Army aviation offers incomparable qualities. Speed, firepower, precision, maneuverability, flexibility,

mass, and surprise — around the clock and in adverse weather: these are its trademarks. Army Aviation introduces onto the battlefield new concepts and technology that allow us to realize the indirect approach in warfare on an unprecedented and massive scale.

To underscore this last point, consider the dramatic maturation that we have experienced in vertical envelopment, a modern form of the indirect approach.

Back on June 6, 1944, American paratroopers of the 101st and 82d Airborne divisions grimly prepared to jump or fly gliders into Nazi occupied France. Green lights went on as aircraft passed over what the pilots believed were the designated objectives.

Fog, flak, and imperfect navigation caused many of the aircraft to miss their designated drop zones. Gliders crashed far from their desired landing sites. Paratroopers landed in pastures, orchards, and towns. They drowned in canals and rivers.

Some came under a withering hail of bullets as they struck the ground. Others wandered aimlessly for hours looking for friend and avoiding foe.

It took all night to assemble units. Throughout the early morning, small bands joined up and moved toward assault objectives. Those that did not land in their assigned drop zones carried out the missions assigned to whatever sector they found themselves in. This largest U.S. airborne assault up to this point in history shocked the Germans. It was audacious. It disrupted Nazi command and control. It obstructed the movement of enemy reserves and artillery. And it demoralized the German defenders.

At the same time, the airborne drops revealed grave shortcomings. While the dispersion of the paratroopers confounded enemy defenders, it undercut the concentration of the meager combat power of the American troops. Lacking firepower and ground mobility, the paratroopers were unable to reach many of their assault objectives. More vigorous Nazi counterattacks would have routed them. The operation was also costly. The 101st, , for example, suffered 3,800 casualties, nearly one-third of its strength, by the end of June 1944.

"[Operation DESERT STORM] was the realization of the dream of aerial envelopment, conceived by the World War II generation and nurtured by American warriors in ... Vietnam."

Compare the D-Day airborne operations with the performances of all of our aviation units — lift, reconnaissance, assault, attack, medical, and command and control — during Operation DESERT STORM.

This was the realization of the dream of aerial envelopment, conceived by the World War II generation and nurtured by American warriors in the jungles of Vietnam.

Speed, mass, precision, and shock, which were unattainable with the dispersed airborne landings in Normandy, were achieved by leveraging the technological reliability and pinpoint accuracy of the Black Hawk, Chinook, Apache, Cobra, Iroquois, and Kiowa helicopters in some of the world's harshest climates and most difficult terrain.

As we look to the future of war in the Central Region, we will build on our recent wartime experience. Capitalizing on advances in avionics, communications, computers, fire control and delivery

systems, munitions, and mobility, we will be able to achieve an unprecedented fusion of intelligence, fires, and maneuver.

Comanche, the centerpiece of the aviation modernization effort, will scout the battlefield around the clock and in all-weather, sharing information and imagery with other ground, air, sea, and space-based sensors.

From these capabilities, friendly forces will share a remarkable extended view of the battlefield and possess the tactical means to reduce target acquisition and engagement times dramatically. Armed with these tools, senior commanders will exploit the lethal punch of the Longbow Apache and use powerful fires from tactical aircraft, artillery, and ground maneuver forces to pummel the enemy across the width and depth of the theater of operations at an extraordinary pace.

Simultaneously, UH-60 Black Hawks and CH-47 Chinooks or a follow-on heavy lift bird, will rapidly project infantry and artillery deep into the heart of the enemy, where they will block lines of communication and wreck reserves. Whatever can be seen will be immediately destroyed. These cascading, simultaneous, punishing attacks will lay waste to the enemy's weapons and collapse his will to fight.

The depth and destructiveness of these vertical envelopments transcend the tactical level of war. Striking the enemy where he is most vulnerable and least prepared to respond is "operational level warfare." Aviation technology offers the theater commander new opportunities: maneuver and firepower to cripple enemy strategic systems and sites, control operationally significant terrain, and destroy the enemy's operational forces. So endowed, today's senior commanders carry the key that unlocks the mystery of the indirect approach on a revolutionary scale that would be the envy of a Lee or MacArthur.

While technological breakthroughs in aviation are an essential part of this transformation in warfare, we must remember that operational success will continue to rest, as it always has, on the shoulders of our young leaders — leaders with highly honed tactical and technical skills; leaders cut from the same mold as Lee, Gavin, Ridgeway, Taylor, Howze, Kinnard, Norton, Hamlet, Casey, and other Army aviation and air assault visionaries. In the words of author Tom Wolfe, we will need aviators with the "Right Stuff."

The "Right Stuff." One either has it or one doesn't. It is a quality that combines speed of mind, dexterity, common sense, courage, physical and mental strength and determination. It involves the willingness to take risks and a yearning to be the best. Army Aviators brandish these rare traits every day as they take-off in a hurtling piece of metal comprised of imperfect mechanical components. They must contend with questionable weather, the trials of fatigue, and well-armed opponents. And they do this 24 hours a day, 365 days a year.

As Tom Wolfe posits, those who pass this seemingly endless series of trials join the ranks of the splendid few at the top — the "brotherhood of the Right Stuff." We are fortunate that the ranks of Army aviation swell with men and women with the "Right Stuff" — soldiers endowed with the traits required to defend our nation and that announce to the world that America's armed forces stand ready to do what must be done to win anywhere, today and tomorrow.

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GEN Peay is the Commander-in-Chief, United States Central Command, MacDill AFB, FL.

FAREWELL
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that it is important that we revitalize what will be the remaining UH-1 fleet in the Army National Guard through a Service Life Extension Program (SLEP). I say that because this aging aircraft will be with us well into the 21st century. I really would prefer to get rid of them all in favor of the UH-60 Black Hawk.

However, as a practical matter, the resources will not be available to do that. But my point on retaining utility aircraft capacity is operative here. If the UH-1 is not expected to be deployable in the future, we need to acknowledge that fact and get on with the business of implementing a cost-effective SLEP program that will allow for their use in an augmentation role while reducing operating costs and improving capability, deployability and safety of the airframe. I believe it is in the best interests of the Army and the country to do exactly that. The simplistic but short-sighted view, in my opinion, is to just eliminate all of the old airframes, with no replacement planned. I don't think it wise or prudent to do that.

I am proud to have been included with a small part of some of the most significant cultural changes that have occurred in the Army National Guard Aviation program over the last five years. I want to highlight a few of them with you because we have not been sitting on our laurels and some of these changes have happened as a matter of course but with great impact for the Army.

To break the "old equipment paradigm," we are in the midst of the much-discussed and debated "off-site agreement" and are accommodating the infusion of some modernized aircraft that are migrating to the Guard as a result of that process. This is one of the clearest examples of consolidating and leveraging the efficiencies of the organization while at the same time we accommodate significant downsizing in the Guard and apply the same resource constraints as the rest of the Army.

In addition, we continue to leverage the Active Army downsizing and modernize our fleet through that mechanism, as well as through the Direct Procurement Program facilitated by the Congress.

We have continued the upgrade of our fixed-wing fleet by placing a twin turbine airplane in every state, fully integrated as part of the Army Operational Support Airlift Command (OSACOM).

This merger of OSA-one scheduler, one mission, one standard, under the command of the National Guard is another superb example of consolidation and leveraging the efficiency inherent in the organization. On the 2nd of October we had the change of command ceremony where COL Art Ries took command of OSACOM at the activation ceremony. My hat goes off to him for the superb effort that he guided and implemented over a two-and-a-half year period.

The Eastern and Western Army National Guard Aviation Training Sites at Fort Indiantown Gap, PA, and Marana, AZ, have provided us the ability to stand on our own in aviation training on both mature systems and modern aircraft. These sites include training of other services and other countries such as the Israeli initiative — AH-1 simulator training for the Israeli Defense Force, and the Singapore initiative — CH-47 training in Grand Prairie, TX with the TXARNG. The strategic location of the four AVCRADs provides us with regional depot maintenance capability that is considered by many to be the best

maintenance in the Army.

We must push the UH-60 refurbishment program to expedite modernization in a most cost-effective manner. The critical shortfall in Black Hawk procurement will have long-term effects on our aviation mission. We are working with the Army and Congress to keep the production line running at a cost-effective rate.

The Guard stepped forward and accepted the challenge to field AH-64 Apaches. This required extreme efforts and special resourcing to accomplish a task that many thought we couldn't handle. We can now point with pride to seven fully certified AH-64 battalions.

With the help of Congressionally added funding, we have fielded OH-58D Kiowa Warriors, currently fielded in the Mississippi Guard with Tennessee next in line to receive this aircraft. Finally, the CH-47D Chinooks have replaced all of the Skycranes — something you old timers thought you'd never see. These "hooks" have been used extensively in Florida for hurricane relief.

I attended your spring convention in Atlanta. With the strength of the natural bonding and relationships between current active members, retirees and the stalwart supporters in the industrial and corporate community. I was impressed with the tremendous pool of resources on display and the great ideas and innovations that this group can muster. I came away encouraged that your association will play a pivotal part in keeping Army Aviation at the leading edge.

I thank you for including me as a member of the Army Aviation Association of America. I am proud to be one of your strongest advocates and look forward to a continuing relationship with you.

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MG D'Araujo was the Director of the Army National Guard when he addressed the Potomac Chapter of AAAA.

DALO-AV

(Continued from Page 16)

tion Support Battalions in all Heavy Divisions by the end of FY96. As more units begin to convert one of the "warts" continuously exposed is the loss of aircraft from the AVIMs. We are working closely with USAAVNC to revisit this decision during the force development update (FDU) process and return organic aircraft into the AVIM structure.

Worldwide Aviation Logistics Conference (WALC). DALO-AV sponsors the annual WALC which is hosted by ATCOM in St. Louis, MO. Many may not know that two years ago we combined the agenda of the annual Aviation Logistics and Maintenance Commanders Conference (held at Fort Eustis) with the WALC. To adapt to this we refocused the WALC around seven workgroups representing Readiness, Supply, Maintenance, Training, ARI, PEO Systems, and ATCOM Systems.

Issues submitted are discussed in an open forum where the emphasis is on *resolving* the problem not *closing* the issue. DALO-AV publishes an annual summary of issues presented to the WALC and tracks all open issues through quarterly VTCs until they are closed.

This approach has resolved over 200 systemic issues critical to the vitality of Army Aviation. The new format has been so successful that MG Adams has designated the Sustainment Panel portion of the Brigade Commanders Conference as the "Road to the WALC." Plan to attend the 1996 WALC, 1-5 April in St. Louis, MO. Contact ATCOM Protocol for hotel information, DSN 693-1046.

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COL Williamson is the Deputy Chief, DALO-AV, DCSLOG, Washington, DC. LTC McGaughey is the Aviation Logistics Officer, DALO-AV, DCSLOG, Washington, DC.

Colonels

Curran, John M.
CMR 420 Box 602
APO AE 09063

Jackson, David C.
18th Medlom Unit 15281
Box 751
APO AP 96205

LaCoste, Gene M.
1 West Staff Row
Fort McPherson, GA 30310

Littlejohn, Edward H.
17th ASG-CM, Unit 45013
Box 3577
APO AP 96338

Moody, Steven J.
5312 Alta Cowa Road
Colorado Springs, CO 80918

Mullendore, Lauren G.
2004 Mara Park Place
Williamsburg, VA 23185

Rini, Thomas J.
JUSMAG-K
Unit 15339, Box 56
APO AP 96203

Lt. Colonels

Delavan, Clark M.
120 S. Garfield Avenue
Libertyville, IL 60048

Jernigan, Wm. Fred
1174A Drennan Park
Fort Campbell, KY 42223

Miller, Richard
681 Stockbridge Court
Fayetteville, NC 28311

Sheahan, Patrick J.
403 Broken Arrow Drive
Enterprise, AL 36330

Townsend, Joseph D.
126 Deer Run Lane
Harvest, AL 35749

Wolf, William T.
333 Tattnall St. (Upper)
Savannah, GA 31402

Majors

Balitski, Dennis A.
4490 East Pikes Peak
Colorado Springs, CO 80916

Ballew, Robert S.
CMR 454, Box 2457
APO AE 09250

Hayes, Mark W.
HHC, 4-501st Avn Regt
APO AP 96208

Klatt, Kenneth W.
HQ USEUCOM
Unit 30400, Box 1255
APO AE 09128

Pennycuick, Richard B.
4337 E Desert Lane
Higley, AZ 85236

Reis, Joaquin F.
P.O. Box 283
California, PA 15419

Shanney, Joseph M.
PSC 450, Box 473
APO AP 96206

Terrell, Louise V.
P.O. Box 6119
Fort Hood, TX 76544

Thornal, Mason W.
302 Lee Circle
Alexandria, VA 22305

Captains

Ault, Robert T.
34 Avellino Road
Fort Bragg, NC 28307

Bird, Allen E.
111-A Gulkana Avenue
Fort Richardson, AK 99505

Cain, Jacqueline
A Co, 3-501st Avn Regt
Unit 15203, Box 8
APO AP 96271

Cowley, Shawn W.
P.O. Box 620188
Fort Rucker, AL 36362

Crogan, II, Richard E.
8 Fox Hill Road
Fairfield, NJ 07004

DeCrane, Sharon E.
231 Highway 134 E., Apt. 513
Daleville, AL 36322

Draper, Michael B.
P.O. Box 620293
Fort Rucker, AL 36362

Evans, Samuel S.
4048 Creek Way
Chester, VA 23831

Faddis, William L.
3341 Clearwater Drive
Clarksville, TN 37042

Hogans, William R.
HHC, 2-501st Avn
Unit 15188
APO AP 96271

Hubbard, Jerry D.
168 Lakeview Drive
Daleville, AL 36322

Kuppich, Laura A.
USA Health Clinic Hanau
CMR 470 Box 4878
APO AE 09165

Luebbe, Eric C.
P.O. Box 11512
Stanford, CA 94309

Lunn, Robert H.
342 Ardennes Circle
Seaside, CA 93955

Nugent, James
206 Lakeside Drive
Enterprise, AL 36330

Polizzi, Gregory
1883 Needmore Road
Clarksville, TN 37042

Rauer, Scott J.
202 Emerald Drive
Enterprise, AL 36330

Rodden, Jonathan D.
16 Kirby Street
Fort Rucker, AL 36362

Stanfa, Mellissa
160-K Treetop Drive
Fayetteville, NC 28311

Tetu, Michael T.
8901 Arabia Road
Parkton, NC 28371

Theiler, Hugh A.
4904 Mikey Drive
Killeen, TX 76542

Thiesmeyer, Erik L.
617 Prospect Avenue
No. 16
South Pasadena, CA 91030

Thurston, Timothy J.
3375 Wylie
No. 41
Helena, MT 59601

Wegner, Robert G.
HSC 127th ASB
Unit 20198, Box 15
APO AE 09165

Wucik, Joseph A.
HHC, 1-501st Avn Regt
Unit 15266, Box 252
APO AP 96205

1st Lieutenants

Cherot, Bevin K.
205 Paddock Street
Watertown, NY 13601

Gambino, Jeffrey
HHC, 2/2 Avn
Box 84, Unit 15427
APO AP 96257

Ridley, Jeffrey
12 Avellino
Fort Bragg, NC 28307

Williams, Robert L.
D Troop, 3-4 Cav.
CMR 464, Box 20
APO AE 09226

2nd Lieutenants

Allen, Coren J.
125 SW Campus Drive
Apt. 10-305
Federal Way, WA 98023

Cope, Brian A.
48 W. Luzon Drive
Fort Bragg, NC 28307

Crawford, Richard K.
4250 Busby Drive
Apt. 302
Sierra Vista, AZ 85635

Demirjian, Michael E.
CMR 464, Box 83
APO AE 09226

Ettrich, Brian B.
A Co. 5/159 Avn Bn
CMR 408, Box 374
APO AE 09182

Hornback, Ronald L.
16203-A Richmond Place
Fort Polk, LA 71459

Kennedy, Joshua S.
603 Blue Wing Drive
Richmond Hill, GA 31324

Kessel, Kimberly J.
P.O. Box 280402
Columbia, SC 29228

Miller, Jason L.
1805 Janis Drive
Killeen, TX 76542

Rieger, Andrew D.
103 Pineridge Drive
Enterprise, AL 36330

Ruch, Jeffrey N.
1156 Windham Court
Fayetteville, NC 28303

Scola, Dominic M.
111 Pine Ridge Drive
Enterprise, AL 36330

Snedden, Michael K.
B Co. 4-501 Avn Regt
Unit 15008, Box 62
APO AP 96208

Sullivan, Stephen K.
505 Briarwood Drive
Apt. IG
Enterprise, AL 36330

Sweet, Erick W. II
P.O. Box 2807
Silverthorne, CO 80498

Tingstrom, Peter B.
2024 Calista Circle
Fayetteville, NC 28304

Wideman, James G.
CMR 414, Box 801
APO AE 09173

Ziniti, Christopher
7356 Old Pohick Way
Lorton, VA 22079

CW4s

Case, Larry W.
Route 5, Box 81A
Gatesville, TX 76528

Golob, Richard M.
1141 Highland Station Dr.
Saginaw, TX 76131

Myers, Raymond A.
D Troop, 2/6 Cav.
CMR 416, Box 34
APO AE 09140

CW3s

Haynes, Gregory J.
2408 Larry Road
Clarksville, TN 37043

Heidtke, Edwin E.
B Co. 3-1 Avn.
CMR 454, Box 1725
APO AE 09250

Sickmeier, David
608 Gardendale Lane
Clarksville, TN 37040

CW2s

Dessinger, Michael D.
3510 Darling Drive NW
Alexandria, VA 56308

Jessen, James C.
P.O. Box 12799
Fort Carson, CO 80913

Jewett, Michael R.
PSC 01, Box 5052
APO AA 34001

Johnston, Jerome J.
7218 Millbrook Court
Fountain, CO 80817

Langewisch, Keith L.
B Co. 2-227 Avn
Unit 20195, Box 1678
APO AE 09165

Lewis, Arglearild
D Troop, 3-4 Cav.
CMR 464, Box 305
APO AE 09226

Martini, Gerald M.
39 East Narris Drive
Fort Rucker, AL 36322

Partridge, G. Stan
RTD, 7-6th Cavalry
616 Hildred Avenue
Conroe, TX 77303

Pegram, Randy T.
13 Markham Street
Fort Bragg, NC 28307

Rudy, Mark L.
B Co. 3/501st Avn Regt
Unit 15566, Box 173
APO AP 96297

WO1s

Bain, Thomas C.
Route 1, Box 504C
Killeen, TX 76542

Boyers, James G.
502 Caprice Court
Raleigh, NC 27606

Cook, Brian T.
5107 Denmans Loop
Belton, TX 76513

Cox, Lori J.
A Co, 1-2 Avn Regt
Unit 15432, Box 9
APO AP 96224

Davis, Jay M.
4132 Charleston Drive
Colorado Springs, CO 80916

Dillon, Ewell B.
5167-1 Ewell Street
Fort Riley, KS 66442

Hohanshelt, Jason T.
26 Red Cloud
Fort Rucker, AL 36362

Koca, Keith J.
450 S. Washington Street
Braidwood, IL 60408

Schaefer, Gary E.
1814 Cedarview Drive
Killeen, TX 76543

St. Dennis, Jamie G.
513 Antler Drive
Enterprise, AL 36330

Zinda, Scott J.
16437 Bodart Street
Hesperia, CA 92345

Master Sergeants

Migliozzi, Tom M. MSG
Colonial VA Chp.VP Awards
102 Pemberton Lane
Williamsburg, VA 23188

Sergeants

Marvin, Robert A. SGT
2318 Andover Drive
Apt. 4
Killeen, TX 76542

Specialists

Wiseman, Deborah SPC
3048 Sheraton Court
No. C
Medford, OR 97504

Privates

Hirtle, Jared P. PVT
542nd Med Co
Unit 15705
APO AP 96208

Watson, Mitchell C. PFC
D Co. 3-1 Avn
CMR 454, Box 1769
APO AE 09250

Zander, Russel R. PFC
221 Stephanie Drive
Clarksville, TN 37042

DACs

Alejandro, Leonard R. Mr.
P.O. Box 625
Marana, AZ 85653

Steelman, Jimmie L. Mr.
215 Stonegate Drive
Dothan, AL 36301

Swanson, David P. Mr.
DynCorp, 542nd Med Co AA
Unit 15705, Box 84
APO AP 96208

West, Scot M. Mr.
3627 Knefl Farm Crossing
Imperial, MO 63052

Civilians

Marriott, Gordon
100 Loyola Drive
Enterprise, AL 36330

Patterson, Ian T.
Westinghouse Elec. Corp.
1725 Jeff Davis Hwy, #400
Arlington, VA 22202

Shannon, John K.
2205 E. Riverdale Street
Mesa, AZ 85213

Retired/Other

Anschuetz, Gunter
Lurchenweg 13
71711 Steinheim
Germany 07144-821176

Donnelly, Steven W.
505 Yucca Drive
Copperas Cove, TX 76522

Downey, David A.
4 Poliquin Drive
Nashua, NH 03062

Goldsberry, Dale A.
221 Williams Street
Fredericktown, MO 63645

Ideus, Eldon H.
P.O. Box 35
Tulsa, OK 74101

Johnson, Gregory T.
PSC 450, Box 350
APO AP 96206

Keller, David W.
1939 Jefferson Street
Hollywood, FL 33020

Ozbolt, Bob
P.O. Box 1290
Tybee Island, GA 31328

Patton, William D.
USDAO-Jakarta
Unit 8134
APO AP 96520

Reeder, William S.
22-B Sheridan Avenue
Fort Riley, KS 66442

Vins, Joseph J.
283 Oak Pass Court
Ballwin, MO 63011

Yeske, Alan K.
406 Trails of Sunbrook
St. Charles, MO 63301

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SGT Carol A. Colson
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SSG Steve Davidson
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PFC Arica C. Davis
SPC Gregory L. Davis
SSG Richard A. Davis
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SSG Warren A. Davis
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PFC James M. Decker
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CPL Michael S. Elliott
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PFC Earl C. Eoff
SGT Dwight N. Evans, Jr.
SPC Joshua T. Ewing
SSG Jose G. Fadell
SFC Ralph Duane Fainter
SSG Jon P. Fallon
SSG Daniel R. Ferriman
SSG Jesse T. Fillebrown
SSG Robert A. Fisher
PV1 Shawn Fitzgerald
PFC Rick A. Flory
SGT Rodger D. Fontenot
SGT Christopher W. Forbes
PV1 Douglas Ford
SGT Monzell D. Ford
SGT Spencer A. Foster
SPC Sherry J. Foxx
SSG Devlin D. Frahm
SPC Darren E. Freyer
SPC John L. Fritchman
SPC Justin L. Froehlich

SGT Gregory E. Fulkerson
SSG Jean A. Galambos
SPC Joe M. Gandy
SSG Charles E. Garland
SPC Eloy G. Garrido
SPC Larry J. Gary
SPC Maximilian D. Geise
PV2 Matthew R. George
SPC Paul G. Getner
SGT Marc A. Gianotti
SGT Heather L. Gilreath
PFC Sterlin S. Glass
SPC Patrick D. Glenn
SGT James M. Goodart
SGT Denny L. Graham
SGT Abigail R. Grantham
PV2 Raymon K. Gray
SPC Charles R. Green
SSG David L. Green
SPC Tyrone R. Green
SP4 Steven R. Gregory
SPC Glasglow S. Griffin, Jr.
SSG Randy Griffin
SSG Shonda L. Griffin
SPC William E. Griffin
SSG Jennifer M. Gubisch
SPC Abelardo T. Guzman
SSG Todd W. Haight
SGT Garland M. Hall, Jr.
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CPL Leslie G. Hall
SGT Roland W. Hallsell
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SGT Larry F. Hauck
SSG Larry R. Hazelton
PV2 John D. Head
SGT Donald W. Hebent
SPC Dennis J. Helle
SSG Brian A. Henk
SSG Leonard D. Henry
SGT Carl E. Hershman
PVT Andrea H. Hill
SPC Malika S. Hill
SPC Marvin W. Hill
PV2 Robert W. Hill
SGT Martha L. Hinojosa
SPC Clyde P. Hippensteel
PFC Brian P. Holden
SGT Scott T. Holdorf
SGT Kevin J. Holliday
SPC William R. Hook, Jr.
PV2 Catherine H. Hooker
SPC Christopher A. Hopkins
SPC Angela N. Horst
SPC Masuda T. Hosein
SSG Lynn D. House
PFC Christopher S. Hueber
SGT Kevin M. Hughes
SGT Robert D. Hunter
SSG Danny R. Hurt
SGT Jacquelyn A. Hutchinson
PFC Joseph F. Hutchinson

SGT Lansing D. Hutchison
SGT Paul G. Hutchings
SPC Kevin M. Hutter
SPC Wind N. Ingalls
PFC Roleona Irby
SPC William J. Irby
SPC Mathew Ireland
SPC Christopher Irizarry
SSG Hector D. Irizarry
SPC Edward J. Irwin
PFC Raschel I. Jafleux
SPC Omar W. Jarrah
SGT Fredrick T. Jenkins
PV1 Daniel H. Jensen
Mr. Jun-Koo Jeon
SGT George A. Johnson
SSG Glenn J. Johnson
SFC James B. Johnson
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SGT Samuel L. Johnson, III
PV2 Shayne R. Johnson
SPC Steven A. Johnson
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PV2 Chad E. Joy
PFC Dennis K. Jutras
SGT Tricia K. Jutras
PV2 Tommy J. Kaiser
PFC Brandi N. Kaminski
SSG Kenneth P. Kauffman
SGT Joseph M. Kaufman
PV2 Christine M. Keifenheim
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CPL Earl Keith, Jr.
PFC Oracaefreda V. Keith
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Mr. James M. Ross
LTC Christopher L. Sargent
SPC Leonard L. Trowbridge

NEB MINUTES

AAAA's National Executive Board (NEB) conducted its Fall meeting during the AUSA Convention in Washington, D.C. on 16 October 1995. Major actions included:

Approval of Distinguished Graduate Courses for AAAA Awards. In accordance with the NEB decision made at the October 12, 1992 NEB meeting to increase the funding and expand the AAAA Distinguished Graduate Awards Program, the NEB was to annually approve the list of courses to be recognized for AAAA Distinguished Graduate Awards. A motion was approved to include courses at the ARNG Eastern and Western Aviation Sites as proposed for inclusion by SGM Culp, AAAA National Member-at-Large.

Approval of ATC Awards as AAAA Functional Awards. A motion was approved to accept the proposal from LTC Donald T. Stuck, U.S. Army Air Traffic Control Activity, for AAAA to establish, as AAAA Functional Awards, the ATC awards that are currently presented annually at the AAAA Aviation Center Chapter Banquet in January.

Revision of Selection Procedures for Fixed Wing Unit Award. To be selected by a subcommittee of the AAAA Awards Committee appointed by the Awards Committee Chairman. A motion was approved to accept the revision of the selection procedures for the Fixed Wing Unit Award.

Ratification of NEB Appointments. A motion was approved to ratify the appointment of LTC Howard T. Comer as a National Member-at-Large. A motion was approved to ratify the appointment of BG Harry H. Bendorf, Ret., to complete the unexpired term of COL Sylvester C. Berdux, Jr., Ret.

Ratification of National Committee Chairmen. A motion was approved to ratify the appointment of Mr. William Pollard as Chairman of the Industry Affairs Committee, MG George W. Putnam, Jr., Ret., as Chairman of the Hall of Fame Board of Trustees, and LTC Howard T. Comer, as Co-Chairman of the Reserve Component Affairs Committee, serving with COL Joseph L. Ferreira, whose appointment had been ratified at the last NEB meeting.

Petition to Amend By-Laws—Section 10, Dissolution. A motion was approved to amend Section 10 to the AAAA By-Laws as follows:

10.1—Upon dissolution of the Association, the assets of the Association shall not accrue to any individual officer or member of the Association, but shall be donated in their entirety to a non-profit, tax-exempt charitable organization, approved by the National Executive Board of the Association, preferably an aviation-related organization, that is approved under Section 501(c)(3) of the U.S. Internal Revenue Service Code, and has demonstrated ability to manage their assets.

AAAA Support of World Helicopter Championships. A motion was approved to provide the Helicopter Club of America (HCA) with $5,000 with the understanding that the amount would be repaid subject to the availability of surplus HCA funds at the completion of the 1996 9th World Helicopter Championships.

AAAA SCHOLARSHIPS AVAILABLE
$154,000 to be offered in 1996

Scholarships "dedicated" to
Enlisted, Warrant Officer, Company Grade Officer,
and Department of the Army Civilian Members.

Funds also available for spouses, siblings,
& children of AAAA members.

Contact the AAAA Scholarship Foundation, Inc.,
49 Richmondville Ave., Westport, CT 06880-2000
Tel: (203) 226-8184 FAX: (203) 222-9863.

Application Deadline: May 1, 1996

Above: MG Ronald E. Adams (left), Commanding General, USAAVNC and Aviation Branch Chief, presents then-CPT Douglas M. Gabram (center), the "Iron Man" of the Aviation Planning Group, with the Bronze Order of St. Michael during an October 1995 ceremony at Ft. Rucker, AL. MAJ Gabram is now Assistant S-3, 3rd ID Aviation Brigade in Bosnia. Looking on is MAJ Gabram's wife, Lori Jo.

Below: AAAA's newest Pacific Rim chapter, the Rising Sun Chapter, has been formed at Camp Zama, Japan. Chapter officers are: Back row, l to r — MAJ David Brown, VP Membership, COL David Booze, SrVP, LTC Ronald Alexander, President, MAJ Michael Dolby, VP Civilian Liaison. Front row: CPT James Knapp, VP, Progams, CW3 Matthew Pellegrino, Secretary, and SFC Jay Maitland, VP, Enlisted Affairs.

New AAAA Chapter Officers

Bonn Area:
CW3 James J. Guyre, Ret. (SrVP); Horst Moddemann (VP, Programming).

Rising Sun:
LTC Ronald H. Alexander (Pres); COL David R. Booze (SrVP); CW3 Matthew M. Pellegrino (Secy); CW2 Michael S. McManus (Treas); MAJ David R. Brown (VP, Memb. Enroll); CPT James B. Knapp (VP, Prog); 1SG Jay W. Maitland (VP, Elist. Aff); MAJ Michael I. Dolby (VP, Civ. Aff); CW2(P) Robert A. Waite, III (VP, Chap. Awards).

Savannah:
CPT Guy M. Zero (VP, Programs).

Virginia Military Institute:
COL Norman M. Bissell, Ret. (Pres); CDT Sean A. McMurry (SrVP); CDT Pol Vireak Ou (Secy); CDT Ryan P. O'Connor (Treas); CDT Karen M. Zelznak (VP, Memb. Enroll); CDT Steven W. Jones (VP, Prog); CDT Jennifer L. Mandeville (VP, Pub. Aff); CDT Needham W. Hall and CDT Michael A. Obadal (SrVPs).

AAAA Aviation Soldiers of the Month

A Chapter Program to Recognize Outstanding Aviation Soldiers on a Monthly Basis

SPC Thomas I. Mainey
October 1995

SGT Jason W. Holland
November 1995
SSG Michael A. Biros
December 1995
(Narragansett Bay)
SPC Joseph A. Munoz
December 1995
(Northern Lights)
SPC Mark R. Bailey
November 1995
(Old Tucson Chapter)
SPC Jonathan Brooks
September 1995
SGT Wayne P. Ashby
October 1995
SPC Marc D. Williams
November 1995
(Talon Chapter)

AAAA Aviation Soldiers of the Quarter

A Chapter Program to Recognize Outstanding Aviation Soldiers.

SGT William J. Bundschuh
SPC James E. Nunn
1st Quarter 1996
(Aviation Center Chapter)
SPC John Flores
4th Quarter 1995
(Mid-America Chapter)
SPC Rebecca K. Vaughn
3rd Quarter 1995
(Old Tucson Chapter)

AAAA Aviation NCO of the Quarter

A Chapter Program to Recognize Outstanding Aviation NCOs.

SSG John C. Betka
3rd Quarter 1995
(Old Tucson Chapter)

Above: COL James M. Sikes (left), Commander, 449th Aviation Group, Jacksonville, NC, was awarded the Bronze Order of St. Michael by LTC Terry Benson (right), State Aviation Officer, NCARNG during a 20 October 1995 meeting of the Tarheel Chapter.

Below: Dr. Charles Ledbetter (left) and Mrs. Eva Ledbetter (right) pose with MAJ Celeita A. Kramer, WVARNG, on the occasion of her induction into the West Virginia Women's Hall of Fame. MAJ Kramer is the first woman UH-60 pilot, and the first UH-60 maintenance test pilot.

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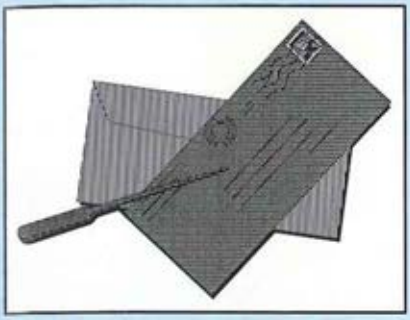

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The AAAA offers its members the opportunity to contact the National Office for addresses and phone numbers of other members with whom they have lost touch over the years.

In addition, as a service to our members, a brief announcement may be placed in these pages to help locate those who are not AAAA members.

Mr. DB Ashton seeks Harley J. Baker (RA15595103)(403-52-5611), a graduate of the 6 Sep 68 Infantry OCS class. Baker, a Kentucky native, was a jumpmaster and had served a Vietnam tour with the 101st Airborne Division before OCS. He was an SFC/E7 before commissioning, and became a UH-1 pilot with the 173rd AVN BDE. His last reported rank was CPT.

Contact Mr. Ashton at Tel (212) 861-5525, FAX (212) 861-5526, or E-Mail jayhawk@walrus.com

AAAA GOES ON-LINE!

The AAAA National Office now has E-Mail capability via CompuServe. Our address is:

74023.3400@compuserve.com

AAAA CALENDAR

A list of upcoming AAAA Chapter and National events.

January 1996

✔ **Jan. 27.** AAAA National Awards Selection Committee Meeting to select 1995 National Award recipients, National Guard Readiness Center, Arlington, VA.

✔ **Jan 31-Feb. 2.** Joseph P. Cribbins Product Support Symposium sponsored by AAAA Lindbergh Chapter & AAAA Logistics Support Unit Awards & AAAA Industry Award Presentations, Stouffer Concourse Hotel, St. Louis, MO.

March 1996

✔ **Mar. 27 - 30.** AAAA Annual Convention, Tarrant County Convention Center, Fort Worth, TX.

✔ **Mar. 27.** AAAA National Executive Board Meeting, Tarrant County Convention Center, Fort Worth, TX.

✔ **Mar. 28.** AAAA Scholarship Board of Governors Annual Meeting, Tarrant County Convention Center, Fort Worth, TX.

April 1996

✔ **Apr. 25 - 27.** AAAA USAREUR Convention, Chiemsee, Germany.

July 1996

✔ **Jul. 19.** AAAA Scholarship Board of Governors Executive Committee Meeting, National Guard Readiness Center, Arlington, VA.

✔ **Jul. 20.** AAAA National Scholarship Selection Committee Meeting to select 1996 National Scholarship recipients, National Guard Readiness Center, Arlington, VA.

October 1996

✔ **Oct. 29-31.** AAAA Colonial Virginia Chapter and AHS Hampton Roads Chapter, Helicopter Military Operations Technology Specialists Meeting (HELMOT VII).

The digital battlefield now includes HF Nap-of-the-Earth communication.

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