1995 AAAA Convention Photo Wrap-up

1995 ANNUAL CONVENTION PHOTO WRAP-UP

ARMY AVIATION

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FORTHCOMING ISSUES
June 1995 — International Army Aviation, Foreign Military Sales, and the Army Aviation Modernization Plan.

July 1995 — Special Operations Aircraft and Night Vision updates.

Briefings

Secretary of the Army **Togo D. West, Jr.** and Army Chief of Staff **GEN Gordon R. Sullivan** have named the divisions that will remain on active duty as the U.S. Army restructures from 12 to 10 divisions. They are: **1st Infantry Division (Mech)**, Germany; **1st Armored Division**, Germany; **1st Cavalry Division**, Ft. Hood, TX; **2nd Infantry Division (Mech)**, Ft. Stewart, GA; **3rd Infantry Division (Mech)**, Ft. Stewart, GA; **4th Infantry Division (Mech)**, Ft. Hood, TX; **10th Mountain Division (LI)**, Ft. Drum, NY; **25th Infantry Division (LI)**, Schofield Barracks, HI; **82d Airborne Division**, Ft. Bragg, NC; and the **101st Airborne Division (AASLT)**, Ft. Campbell, KY.

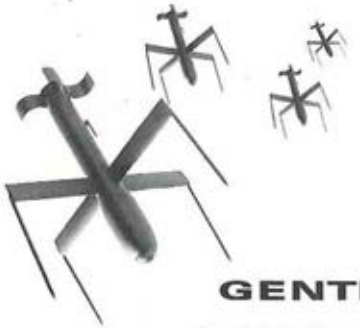
GEN Dennis J. Reimer has been named by President Bill Clinton to succeed **GEN Gordon R. Sullivan** as Chief of Staff of the Army. GEN Reimer is currently Commanding General, U.S. Army Forces Command (FORSCOM). Reportedly, **GEN John H. Tilelli, Jr.** has been nominated to succeed GEN Reimer at FORSCOM.

The **Boeing Sikorsky RAH-66 Comanche** has achieved two significant milestones — the first power-on and the fitting of the Main Dynamics Module, which were accomplished in the assembly of the first Comanche prototype. The RAH-66 is the first helicopter to employ an advanced 270 volt DC electrical power system instead of the 115 volt AC system used on current military aircraft. The 270 volt system is lighter, more efficient, and provides no power interruption during normal aircraft startup and shutdown.

The **OV-1 Mohawk Association's** 6th Annual Reunion will be held at the Clarion Airport Hotel, Tucson, AZ on September 29-October 1, 1995. A visit to Ft. Hauchuca has also been planned. For more information, contact the OV-1 Mohawk Association, 11724 67th Place North, Maple Grove, MN 55369. Tel: (612) 493-5522 or (408) 371-9156.

The **U.S. Army Aviation and Troop Command (ATCOM)** will host a hazardous materials management conference in St. Louis, MO July 18-20 1995. The conference will bring together requirers, suppliers, manufacturers, researchers, and users to discuss the implications of the decline in usage and availability of the EPA list of 17 hazardous materials and will examine progress to date in developing substitute materials and processes. The forum will allow users to voice their issues in hazardous materials management and to listen to new developments. For more information, contact Van Riggs at Commercial (314) 298-3932, FAX (314) 344-8505 or Mark Maus at DSN 693-5416, FAX 693-3102.

The **Army Otter-Caribou Association** will hold its 10th Annual Reunion in Braintree, MA from August 16-20 1995 at the Sheraton-Tara Hotel. For further details, contact Bruce Silvey, (800) 626-8194.



GENTLEMEN, DON'T START YOUR ENGINES.

IT'S LAUNCHED IN A STANDOFF MISSILE. DISPERSED WITH OTHER UNITS OVER THE ENEMY FORCE, ENABLING A "MANY ON MANY" ENGAGEMENT. ITS ACOUSTIC AND INFRARED SENSORS ALLOW IT TO HEAR A TANK FROM MILES AWAY. WHICH IT THEN FINDS AND DESTROYS. INTRODUCING BAT, THE FIRST OF A NEW GENERATION OF "BRILLIANT" ANTITANK WEAPONS. MADE POSSIBLE IN NO SMALL PART BY NORTHROP GRUMMAN'S YEARS OF EXPERIENCE IN ADVANCED SENSOR TECHNOLOGIES. OUR LEADERSHIP IN AIRCRAFT DESIGN, STEALTH TECHNOLOGY, COMPOSITES, COUNTERMEASURES AND SENSORS PUTS US IN AN ELITE GROUP OF DEFENSE COMPANIES UNIQUELY ATTUNED TO THE WAY THE WORLD IS TODAY. AND WILL HELP US STAY THAT WAY FOR MANY YEARS TO COME. NORTHROP GRUMMAN. THE RIGHT TECHNOLOGIES. RIGHT NOW. **NORTHROP GRUMMAN**

VOLUME 44 ARMY AVIATION NUMBER 5

FEATURE ARTICLES

1995 AAAA CONVENTION PHOTO WRAP-UP

FOCUS: UAVs and SIMULATION & TRAINING

DEPARTMENTS

FRONT COVER

Paid Advertisement: McDonnell Douglas Helicopter Systems. *Two of the U.S. Army's six AH-64D Longbow Apaches return from the Army's three-month-long Initial Operational Test and Evaluation (IOTE) exercises at Ft. Hunter-Liggett, CA. The successful IOTE compared the next-generation combat capabilities of the AH-64Ds against the Army's current AH-64A Apaches. Official results are expected to be released by the Army this summer. Caption provided by the advertiser.*

ARMY AVIATION: MOVING FROM THE PAST TO THE FUTURE

An address by the Chief of Staff at the AAAA Annual Convention, Friday, 31 March 1995, Atlanta, GA.

The Chief of Staff describes how Army Aviation produces positive results in real world operations.

The defense of the United States of America is a shared responsibility. All of us in this room share in the defense of America — the Armed Forces, our elected and appointed officials, and members of the Army Aviation Association of America.

The AAAA brings the entire Army Aviation family together — active, Army Reserve, National Guard, Army civilians, contractors, retirees, veterans, and friends of Army Aviation. In the interaction between the Army and AAAA, we participate together in that process, and in the process of transforming America's Army into one that will serve the nation in the 21st century. Today we are working together to grow the future Army — an Army that leverages information to make our forces more versatile, more rapid, more flexible, and more lethal — Force XXI.

I want to thank the entire Aviation community for everything you have done for America's Army. All of you do your part in the defense of our Nation. I also want to thank you for what you in the aviation community are doing to make Force XXI a reality. Chances are, no one is going to send you a letter saying, "Thanks, you've done a great job." But I want you to know that your Chief of Staff thanks you. You should be very proud of what you have accomplished.

When I became the Chief in 1991, we faced very difficult challenges. We had to make the Army smaller by about a third, and we had to remain trained and ready while we did it. We had to remain ready to fight and win the Nation's wars. We had to re-think our mission orientation, and re-work our doctrine to accommodate the new realities — expanded missions, diminished resources, and a technological revo-

lution. For decades, we had been a forward-based Army, focused on defeating a Soviet attack in central Europe. We had to become a power-projection Army, primarily CONUS-based, ready to respond to a wide spectrum of missions — ranging from major regional conflicts to various types of operations other than war. And through it all, we had to look for ways to make the Army better. Just plain "different" isn't better. Smaller isn't better. Better is better.

I believe we have succeeded. You have succeeded. The Army's achievements over the past three and a half or four years are very significant. We are not sitting around talking about what was and how great it was. We are not discussing what used to be. We are discussing change and growth, and we are making it happen.

Anyone who wants a good example of our achievements can look at what we did in Haiti. The 82d Airborne Division and Special Operations Forces were in the air — *in the air* — when we turned them around. We moved what was to happen on Day Three up to Day One, and executed the operation flawlessly. The *New Yorker* magazine said in October 1994, it "unfolded very like a triumph."

That's growth, that's change, that's America's Army in 1995. And Army Aviation has played — and contin-

THE HUNTER UAV SYSTEM HAS ACHIEVED:

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- FIRST SYSTEM ACCEPTANCE
- LAND AND SEA OPERATIONS
- PRODUCTION READINESS

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HUNTER: THE JOINT TACTICAL UAV

IAI

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ues to play — a key role in our success. Army Aviation, featuring firepower, mobility, speed, and versatility, paces our efforts. You can see this when you look at some of the operations America's Army has been involved in over the past two or three years. Our operations have increased 300% in recent years, and aviation has been there every time — Somalia, Cyprus, Turkey and Northern Iraq, Rwanda, Panama, Macedonia.

The 10th Aviation Brigade and Task Force 2-25 Aviation were the centerpiece when the 10th Mountain Division went to Somalia. Active and National Guard aviators have provided support in response to disasters all around the nation — fighting forest fires, rescuing people stranded by floods, providing relief after earthquakes and hurricanes. Army Aviation makes the entire MEDEVAC concept possible — and over the years, that has translated into countless thousands of lives saved.

In Haiti, I think we surprised a lot of people when we launched Army helicopters from the decks of the USS *Eisenhower*. But it didn't surprise me, and it didn't surprise the people in the aviation community, because for nearly a year in advance of that operation, Army aviators had been training to do it. Army helicopter pilots were flying four hour missions over water, at night, wearing night vision goggles, launching and recovering from Navy ships. That is not amateur sport! That is dangerous business, and it requires skill and courage. Every time an aircrew straps on an aircraft and launches, that requires skill and courage.

These men and women of skill and courage will be the heart and soul of the Army as we move into the 21st century. We are well along the road to building the 21st century Army — Force XXI. We are linking our systems together, using information age technologies to enable our commanders to apply their power with maximum effectiveness.

Our overarching strategic objective is to transform today's power projection army into an army capable of land force dominance across the continuum of 21st Century military operations — Force XXI. It is information technology, the microprocessor and its related technologies, that will make possible the physical implementation of our Force XXI concepts. However, the technology is not an end in itself. We are not transforming the Army in order to take advantage of the new technology — but the new technology enables us to transform the Army.

Digital technology is not, in fact, new to the Army. Over the past few years, several weapon systems have been upgraded to incorporate the capabilities of emerging digital technologies. What is new is the realization of the power we can gain by

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integrating those digital systems throughout the force. This integration will enable our forces to derive a common understanding of the operational environment. Battle command will be based on real-time, shared, situational awareness — not the same map sheet, but the same map — enabling us to increase the pace of battle beyond any enemy's ability to keep up. This is winning the information war — and the key to dominating maneuver, conducting precision strikes, and protecting the force.

The Army Aviation community has helped create the Army we have today, and you are contributing to the Army of tomorrow — to Force XXI. The Longbow Apache and the Comanche are two exciting examples of the aviation community leading the way. The Comanche gives us the ability to integrate multiple weapons systems throughout the battlespace with unprecedented speed and precision — with a devastating level of effectiveness. We are creating more effective, more lethal forces. We are product--improving equipment like the Longbow Apache and the Kiowa Warrior — not upgunning in the traditional sense, but exchanging and integrating information, and using it to increase our lethality.

The AH-64D will lift the fog of war. The Longbow radar will give us adverse weather capability to conduct stand-off engagements — through rain, snow, smoke, and all the battlefield obscurants. We have already proven this in tests — Apaches fitted with the Longbow Fire Control Radar System are using fire-and-forget Hellfire missiles. The AH-64D will also have advanced data communications links with armor, artillery, and infantry forces. This is an example of the information integration that is the heart of Force XXI, and it is not something in the distant future. The first Longbow Apaches will be delivered in March 1997, and we will reach initial operational capability (IOC) in December 1997.

Comanche is not just a better helicopter. It gives us the ability to integrate multiple weapons systems throughout the battlespace with unprecedented speed and precision — with a devastating level of effectiveness. It is the first 21st century weapon, and we will do all we can to bring it into our inventory. I am very pleased that OSD approved the money for eight Comanches on 21 March. We will receive the first prototype this November. As of now, we have the money for two prototypes and, in FY 2001, six demonstrators.

In the final analysis, however, everything we are doing is designed to leverage the power of the American soldier. It is all about increasing the power and the capabilities of the pilot, the gunner, the crew chief, the tanker, and the infantryman.

Although many things in the world have changed, war in the future will be as we know it. It will

require well-trained, well-equipped men and women who are willing to put their lives on the line — who "strap on their aircraft" and do the hard, dirty work of war. There are no silver bullets. We must be more lethal, faster, better protected, and versatile — and those are exactly the things that Force XXI makes possible for our soldiers on the battlefield.

There is power in enabling all the commanders on the battlefield to see the same situation on the same map. There is power in a scout helicopter that can digitally transmit that situation to the infantry and the armor and the artillery. There is power in being able to acquire and kill targets through all types of weather and battlefield obscurants. As we experiment, and grow, and learn to take maximum advantage of the latent power of the 21st century Army, we want to put that kind of power into the hands of our soldiers. One thing is certain — Army Aviation will play a very critical role as we grow America's Army into the next century.

★★

GEN Sullivan is the Chief of Staff, U.S. Army, Washington, D.C.

VIDEO TAPES

A 12-minute video tape featuring author Tom Clancy, Digital Cavalry, Force XXI, was presented by the CSA during this address. Contact the AAAA National Office at (203) 226-8184, FAX (203) 222-9863 to borrow a copy of this or any other Professional Session tape from the 1995 AAAA Annual Convention.

MISSION BACK-BRIEF: ATLANTA '95

The Branch Chief reviews the highlights of the 1995 AAAA Annual Convention.

Congratulations to the staff of AAAA for orchestrating a very successful convention in Atlanta. The efforts of all involved in putting this great event together were clearly exceptional — thanks for a job well done!

Thursday's keynote address was presented by the Honorable Togo D. West, Secretary of the Army. He gave us a powerful message, again confirming the need for Comanche, and adding much credibility to the relevance of Army Aviation in the Force XXI operational concept. The afternoon breakout sessions featured LTC Rich Clifford, who shared his experiences in the Army Astronaut Program, and COL Larry Casper, Commander, Aviation Brigade, 10th Mountain Division, who provided an overview of Operations Continue Hope and Restore Democracy. Both great presentations!

Friday's professional sessions included updates by MG Dewitt T. Irby, Jr., Program Executive Officer, Aviation and MG John Cowings, Commander of the Aviation and Troop Command. Their agencies are vital pieces of Army Aviation, and we all appreciate their great work.

GEN Gordon R. Sullivan, Chief of Staff of the Army, highlighted Friday's activities. It was a special privilege to have GEN Sullivan speak to us. He stressed the importance of Army Aviation as an integral player in the Force XXI vision to the packed convention hall audience. GEN Sullivan's address is the guest editorial in this issue — so be sure and read it. It provides great insight on the future of our Army ... Comanche is still at the forefront, and with the support of our senior leaders, it will surely continue to mature.

The Honorable Gilbert F. Decker, Assistant Secretary of the Army for RDA, another eloquent spokesman

for both Army Aviation and the Comanche, highlighted our Saturday session. The morning continued with the three Forums — Acquisition, Logistics and Operations and Training. For the latter, we owe thanks to MG Jack Keane, Commanding General 101st Airborne Division (Air Assault); BG Morris J. Boyd, Deputy Chief of Staff Doctrine, TRADOC Headquarters; and Colonel Gene LaCoste, Commander Aviation Brigade, 82d Airborne Division for their participation and super presentations. We had two other division commanders present; MG Joe DeFrancisco, 24th Infantry Division (Mechanized) and MG Randy House, 1st Infantry Division (Mechanized). Their participation added a true combined arms team perspective. We were pleased to have had all three of these division commanders with us.

The convention concluded with the AAAA Banquet. GEN Dennis J. Reimer, Commanding General of FORSCOM, was guest speaker. He shared his insights on what aviation as a branch means to the Army team with the powerful statement, "Without Army Aviation the Army has no future." What a great way to conclude our convention.

I extend my personal thanks to MG Benjamin Harrison, Ret. who completed his term as President of AAAA, passing the gavel to the new President, MG Richard E. Stephenson, Ret. Ben Harrison gave us great leadership during a time of accelerating change and I'm sure Dick Stephenson is more than up to the challenges of the future.

Thanks also to our industry team members for their support of our convention and for all they do in providing America's Army the technological edge that will ensure we remain the premier Army in the world.

This issue features articles on Unmanned Aerial Vehicles (UAV) and Simulation. UAV's ability to relay real-time reconnaissance, surveillance, target acquisition and battlefield observation back to ground control and monitoring stations will increase the situational awareness of commanders throughout the entire battlespace. UAVs will provide information essential for accurate combat decisions and we in Aviation need to "capture" the capability they bring to the force.

Further advancements in technology are providing the highest quality aviation simulation while reducing costs. Colonel P.J. Penny's Directorate of Training, Doctrine and Simulation continues to refine the Army Aviation simulation requirements for our capstone strategy.

We must continue to keep our sights on the future by remembering the words of GEN Sullivan, "The Army Aviation community has helped create the Army we have today, and are contributing to the Army of tomorrow — to Force XXI."

Thanks again for everyone's participation in a great convention. Let's continue to keep our sights square on the future.

★★

MG Adams is the Aviation Branch Chief and CG, USAAVNC and Ft. Rucker, AL, and Commandant, USAALS, Ft. Eustis, VA.

BY CPT R. CASH SNIVELY

PREDATOR: AN ADVANCED CONCEPT TECHNOLOGY DEMONSTRATION

A new acquisition strategy saves time, money, and adds a needed capability.

"The approach [to acquisition] evolved during the almost half century of the Cold War is today excessively expensive and slow for the dynamic situations we face now. My function is to marry the maturing technologies emerging from the science and technology programs with critical military needs and to develop the processes which will respond more rapidly to these military needs at substantially reduced cost."

— Mr. Larry Lynn, Deputy Undersecretary of Defense for Advanced Technology, during Congressional testimony, 8 March 1994.

Mr. Lynn was describing acquisition reform's newest tool: the Advanced Concept Technology Demonstration (ACTD). ACTD programs have arrived, and Military Intelligence (MI) is involved in a big way, starting with the Predator ACTD.

The Predator ACTD is officially known as the Medium Altitude Endurance Unmanned Aerial Vehicle (MAE-UAV) program. It is an integration effort designed to demonstrate a significant, new military surveillance capability. The ACTD is based on advanced technologies and is designed to establish the operational utility and system integrity of Predator. It is MI's first ACTD program, and is one of six original ACTDs under this new acquisition strategy.

The Predator program is primarily the result of operational requirements identified during DESERT STORM. Commanders needed a platform that could provide long dwell, near-real-time reconnaissance and surveillance of the battlefield. The Defense Airborne Reconnaissance Office (DARO) completed an "Integrated Airborne Reconnaissance Strategy" study early in 1994. The study noted that we employed over 85% of our

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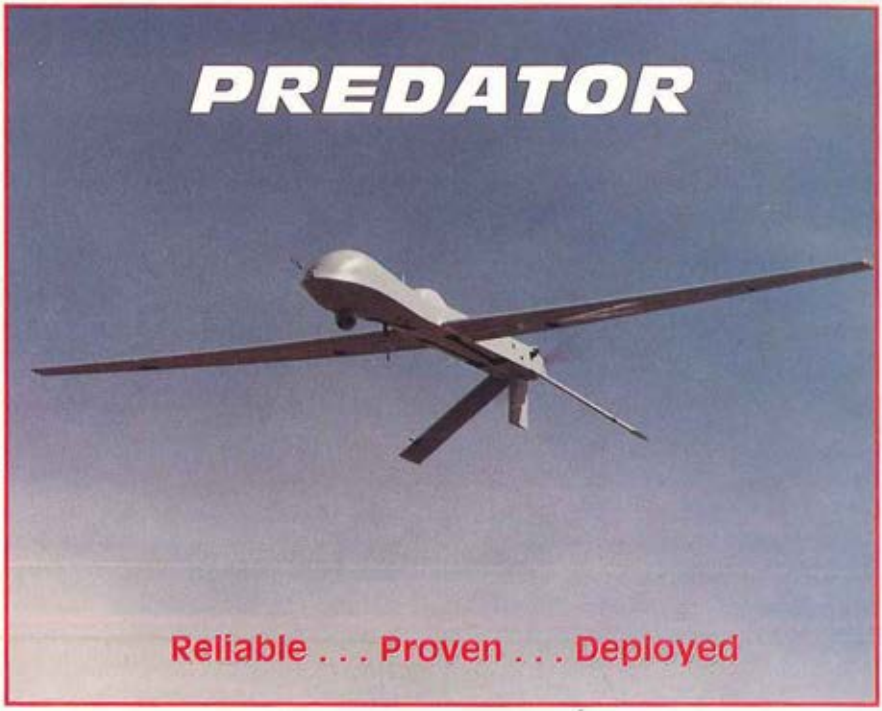

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The Predator MAE-UAV has a 49 foot wingspan and a range of 3,975 nautical miles.

reconnaissance assets during DESERT STORM. The DARO study also stated: "It is obvious that future requirements will exceed our current capacity to collect, process, and exploit information."

The ACTD management plan for the MAE-UAV describes the intelligence shortfall driving the Predator program as follows: "Current, national, theater and tactical intelligence collection assets are insufficient to provide for urgently needed, critical, worldwide, releasable near-real-time intelligence information on fixed and mobile targets for the in-theater Commander-in-Chief, Joint Force Commander, and the National Command Authority. No system exists which can provide continuous all-weather coverage of worldwide targets. National sensors cannot provide long dwell coverage of small mobile or fixed targets. Existing theater airborne assets are limited by endurance of less than eight to 12 hours, limited numbers, and possible loss of air crew over hostile areas. Other than the MAE-UAV, there is no endurance UAV that will be available to military commanders in the near future."

The MAE-UAV provides a cued reconnaissance capability designed to fill this collection shortfall. It provides long dwell coverage for a variety of surveillance missions. Multiple sensor packages include electro-optic and infrared (E-O/IR) sensors, as well as a Synthetic Aperture Radar (SAR).

General Atomics-Aeronautical Sys-

tems, Inc. (GA-ASI) is the prime contractor for the MAE-UAV program.

The DARO, as responsible agent for developing and managing the airborne reconnaissance architecture, provides funding and oversight at the Office of the Secretary of Defense level. The UAV Joint Program Office is the executing agent for the ACTD, providing daily program management.

The MAE-UAV detachment is staffed with a mixture of personnel from all services. Soldiers provide the bulk of assigned personnel (23 of 39), with most coming from the Military Intelligence Battalion (Low Intensity) in Orlando, FL.

The MAE-UAV is designed as a unique system to support the Joint Task Force commander. The Joint Staff provides tasking for operational deployments in support of joint operations.

Because costs continue as a major driver in equipment acquisition programs, the Predator ACTD is designed to maximize each dollar spent. The entire 30-month ACTD budget is just over $92 million, and includes delivery, testing, and training on:

- Ten air vehicles.
- Three Ground Control Stations (GCSs).
- Three TROJAN SPIRIT II systems.
- Various payloads and supporting equipment.

The Predator ACTD is an ambitious program, with tight timelines, integration requirements, and unforeseen challenges. The contract called for delivery of the first air vehicle and GCS just six months from the date of contract award. The actual contracting process, usually cumbersome and lengthy, was completed in only 40 days!

While details were being worked out at the contracting table, GA-ASI was completing design work on the Predator air vehicle and its supporting systems. When Predator was first proposed, nothing existed except the plans, drawings, and concepts for how it would operate. Although the design was based on an earlier GA-ASI design (GNAT-750), Predator was a huge leap forward in many areas. The fact that it was delivered in just six months makes it even more incredible.

On 31 August 1994, Predator was officially presented during a ceremony at El Mirage, CA. At the ceremony Maj Gen Kenneth Israel, USAF, Assistant Deputy Undersecretary of Defense for Airborne Reconnaissance, said: "Predator is the first and biggest success among the Defense Department's Advanced Concept Technology Demonstration programs. This is the kind of capability that this nation sorely needs..."

A Different Approach. The Predator does many things other UAVs do, but Predator does them better, longer, higher, and for less money. Operational altitude for the air vehicle is situation dependent, but can reach up to 25,000 feet above sea level. Normal missions place the air vehicle from 5,000 to 15,000 feet above ground level. This places Predator out of small arms range. At these altitudes, it

is difficult to detect or track the air vehicle due to its low heat and sound emissions. Although low observability and a small radar cross-section were not requirements for the MAE-UAV, they both are resident in Predator.

Predator air vehicle operators are currently all rated military aviators or civilian pilots. They sit at a console similar to a commercial aircraft cockpit. The operator sees through a nose-mounted camera, allowing a view of the runway for take-off and landing operations. A sophisticated mission tracking system also shows the air vehicle location overlayed on a digitized map display. Payload operators sit at an identical console, with the joystick controlling the E-O/IR cameras. Data exploitation takes place at a separate console, where two imagery analysts manipulate and annotate imagery.

Missions. Predator is designed for detailed observation of specific areas rather than broad area searches. The E-O/IR systems provide high resolution imagery ideally suited for:

- Battle damage assessment (BDA).
- Indications and warning (I&W).
- Cueing.
- Route reconnaissance.
- Support to rapid restrike missions.

Flexibility within Predator's mission planning system allows for pre-programmed routes. This mission profile and the immediate responsiveness of the system to operator commands via the SATCOM data link make Predator ideally suited for route and point target reconnaissance.

To maximize the UAV's ability to locate targets, operators will normally cue Predator from other systems such as Joint Surveillance Target Attack Radar System (Joint STARS), U-2R, or national systems.

The entire MAE-UAV system is designed to deploy via C-130 or C-141 aircraft. Depending on mission requirements, a Joint Task Force can move the system to a new location and prepare it for operations within six hours. Operators transport the air vehicles, with wings and tail removed, inside 30-foot long "bird boxes". These unique fiberglass storage containers provide a climate-controlled environment and protect the air vehicle during shipment.

Endurance and High Performance. Predator provides new meaning to the phrase *long dwell time*. A SATCOM datalink allows the launch and recovery site to be up to 500 miles from the target area. Predator could transit the 500 miles, stay in the target area for 24 hours, and then return to the recovery site. In fact, it should stay airborne for up to 60 hours on a single fuel load.

The ROTAX 912 engine that powers Predator is the same powerplant used in many ultra-light aircraft. GA-ASI adds their own fuel injection system to optimize performance and increase fuel efficiency.

The entire airframe structure, less fuel, electronics, and payload, weighs under 350 pounds! Manufacturing and assembly techniques are similar to those used in making high performance sail planes.

Retractable landing gear, attention

to drag reduction, the extensive use of composite and lightweight materials, and an unusual shape maintain the aircraft's efficiency. Even the process of applying the grey paint to the Predator saves weight.

Unclassified Imagery. The MAE-UAV program is designed to provide unclassified, releasable, and high-quality imagery (E-O/IR and SAR). The use of commercial, off-the-shelf sensor technology allows the entire system and its capabilities to remain unclassified. This includes the SAR capability to provide one-foot resolution imagery. The off-the-shelf approach to sensors simplifies handling imagery products, reduces costs, and eliminates concerns if sensors are lost during a mission.

Predator has the ability to provide high resolution imagery, transferred in near-real-time, to users almost anywhere in the world. It does this by passing information through the Joint Defense Intelligence Support System terminal mounted in the TROJAN SPIRIT II, into existing C4I systems.

Schedule. During the ACTD, Predator is scheduled to take part in several tests, two major deployments, and constant integration of technologies such as the SAR and a wideband SATCOM data link. With almost half of the 30-month ACTD schedule completed, the program continues to progress towards full mission capability. Both the SAR and the wideband datalink are expected to be operational by mid-1995.

The detachment has completed over 400 hours of flight training at Ft Huachuca, AZ. After the intense six month train-up period, the detachment deployed in support of the ROVING SANDS joint military exercise in New Mexico. The month long deployment included all 39 MAE-UAV personnel, contractor support personnel, and two of the five completed Predator air vehicles. At the end of the ACTD, GA-ASI will have delivered:

- Ten air vehicles.
- Three GCSs.
- E-O/IR and SAR payloads.
- Supporting equipment.

Other residual capabilities include three TROJAN SPIRIT IIs and a joint cadre of trained personnel.

Since Predator is not a normal acquisition program, there are several options for the system upon completion of the 30-month ACTD. It could grow into a full acquisition program, continue as a one-of-a-kind unit, or join other systems that are "put away" for later use. At this point it seems clear that Predator will add a much needed capability to the dwindling supply of surveillance platforms. This fact alone should ensure Predator remains busy long after the ACTD is completed.

It is not often the military has a chance to do things smarter, faster, and still save money. The ACTD process and Predator show us we can do all of these things.

★★

CPT Snively is with the Concepts Division, DCD, U.S. Army Intelligence Center and Ft. Huachuca, AZ.

BY COL P.K. TANGUAY

FIRST PRODUCTION HUNTER UAV ACCEPTED

The quest to put another arrow in Army Aviation's quiver moved a big step closer to fulfillment on 14 April 1995 when I accepted the first Phase Two system of the Hunter Joint Tactical Unmanned Aerial Vehicle (UAV).

The 304th Military Intelligence Battalion, Ft. Huachuca, AZ is the first unit to receive LRIP Hunters.

By the time this edition of ARMY AVIATION hits the street, we will have begun turning this system over to the 304th Military Intelligence Battalion at Ft. Huachuca, AZ. It is the first of seven Low Rate Initial Production (LRIP) systems to be accepted on a 1993 contract valued at $171,000,000.

The remaining LRIP systems are expected to be accepted this fall, and we will put them to immediate use, also, with other active military units.

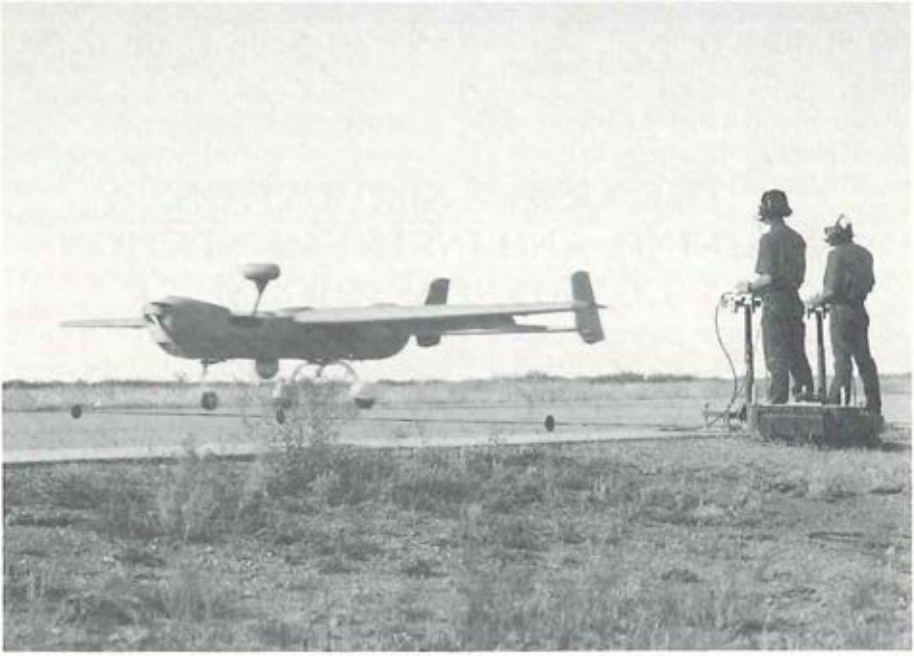
As I said at the acceptance ceremony, these unmanned craft are designed to go in harm's way so that aircraft with pilots and crew on board won't have to.

That means that in the future, military forces engaged in reconnaissance and surveillance missions will be able to carry out their mission with less risk of injury, capture, or death.

Some press accounts of the event reported that I said, "We are back on the Yellow Brick Road, heading for Oz." I hope that no one takes this comment to mean I think we are home free. For, indeed, there are long hard days ahead before the Hunter assumes its full and rightful place on the Army air and ground forces team.

But, after what might be called our winter of discontent, we are at last basking in the warmth of spring. While there are tough days and hard work ahead, I am optimistic that the hard times we have endured have toughened us and prepared us to complete the job of fielding the 50 Hunter systems the military forces need.

Though I am reluctant to dwell on



the negatives from the past, I think it is in order to recall that the Hunter program had run into difficulties. We overestimated the system's technical maturity and underestimated the amount of integration required. But that is behind us.

The first big step was to get the air vehicles back in the air. This we have done. Following our stand down starting 31 October 1994, we resumed flying in the Ft. Huachuca, AZ area on 28 February 1995. (The contractor team of TRW and Israel Aircraft Industries actually started flying in Israel in December, proving out software fixes and other updates or improvements to the system.) Those flights in Israel gave us confidence that proper corrective action had made the Hunter airworthy. We proceeded to acceptance, culminating with the signing of the DD-250 on 14 April.

My plan is to begin turning System One over to the 304th MI Battalion starting on 30 April and completing on 2 May. The 304th has already begun training on the Hunter, preparing for the day when they will be comfortable enough with the new system to give up the Pioneer UAV now in use. This unit will be a deployable UAV unit while simultaneously completing training and the remaining operational test kinds of activities.

Other military units will be equipped with the Hunter as the system completes the acceptance process. The **(HUNTER — continued on page 58)**

THE ARMY'S SIMULATION, TRAINING, AND INSTRUMENTATION COMMAND: STRICOM

The focus of Simulation and Training on the modern Battlefield has revolutionized the way America's Army fights today and how it will fight as FORCE XXI. STRICOM is a vital tool of the U.S. Army which will provide critical data points to determine the size and shape of this FUTURE FORCE.

A software-oriented Major Subordinate Command with four PMOs.

Formed as a new Major Subordinate Command (MSC) of the Army Material Command in August 1992, STRICOM has transformed the hardware intensive Project Manager's Office for Training Devices (PM TRADE)into a software oriented organization consisting of four unique Project Management Offices.

The Project Managers for Combined Arms Tactical Training (CATT), Instrumentation, Targets and Threat Simulations (ITTS), Distributive Interactive Simulation (DIS) and TRADE all have new missions and visions which now focus on a better trained and ready force in the 21st century. The STRICOM Vision underpins AMC and Army visions as the World Leader in Simulation and Training technologies.

During my two years as STRICOM's first Commanding General, I witnessed this command's emergence as a world class leader in information technology, Distributive Interactive Simulation, and intense management of the Synthetic Environment.

STRICOM's motto, "All But War Is Simulation", is best described by this new Synthetic Battlefield. STRICOM brings together Virtual, Constructive, and Live Training to form a complex and evolutionary synthetic environment. To be successful, STRICOM must incorporate the fundamental physical and intellectual changes in Doctrine resulting from Army downsizing initiatives and the changing world order to transform today's

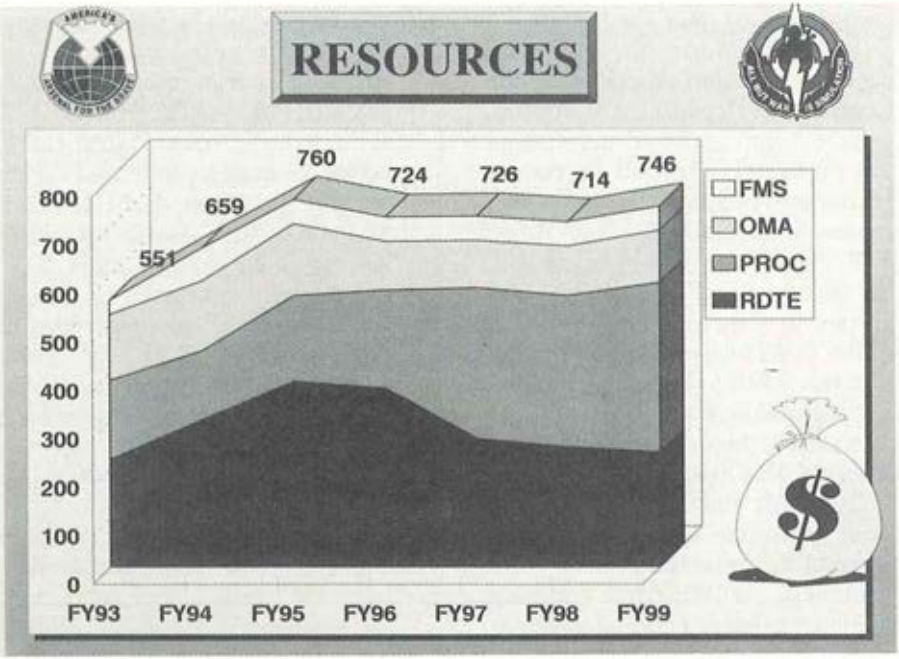
Army to the Army of the Future.

The emphasis today placed on training and distributed simulation by the Congress, the Department of Defense, and the Army catapulted and strained this organization beyond its current resources to become the only growing commodity command in the Army. STRICOM's growing budget exemplifies the importance of the STRICOM mission to the Army and the DoD. STRICOM's total obligation authority rose nearly $210M between FY93 and FY95. Simulation and Training initiatives such as the work going on at the Aviation Test Bed at Fort Rucker, USSOCOM, and the A2ATD program constitute significant growth areas for this command.

Although STRICOM's mission continues to expand beyond traditional training programs, many of the Training Aids, Devices, Simulators and Simulations (TADSS) previously developed and fielded by the PM TRADE are still pertinent training programs today. For over 20 years, PM TRADE has acquired and supported high quality training devices for the Army and Army Aviation. As the executive agent for instrumenting the Combat Training Centers, PM TRADE continues in the forefront of the development of training products which support the "live" piece of the synthetic environment.

Since 1974 PM TRADE's traditional contribution to the Aviation Community has been significant. The very successful Synthetic Flight Training Simulator (SFTS) and Miles AGES programs represent only a few of the milestones which helped pave the way for Aviation as the continuing Vanguard of Change in our Army. Just last year, PM TRADE signed DD250s at the 160th SOAR's Wolcott Hall for two of the most sophisticated Combat Mission Simulators, the MH-47E and MH-60K CMS. These magnificent devices along with all other STRICOM fielded systems enjoy the same "cradle-to-grave" support which ensures that all STRICOM fielded TADSS are operational and remain relevant for our great soldiers in the field.

In addition to PM TRADE, the Project Managers for ITTS, CATT, and DIS manage many traditional and non-traditional simulation and training programs which further enhance Army Aviation's role on the Combined Arms battlefield. PM ITTS has made huge strides in instrumenting targets and threat simulators for training and test agencies. For more than two years, PM ITTS supported Longbow Apache testing with foreign materiel and a threat air defense array system. The Targets Management Office (TMO) and the Threat Simulator Management Office (TSMO), offices within PM ITTS, provided extensive support to the entire Longbow Apache test. The TMO provided total package support to both developmental and operational test phases of Longbow Apache testing. In support of the Force Development Test and Evaluation (FDTE) and the IOTE, the PM ITTS TSMO in conjunction with the OPTEC Threat Support Activity (OTSA) provided the first,



accredited, state-of-the-art threat environment consisting of a complex opposing force threat array and a mobile surveillance radar and command, control and communications system, a surface-to-air missile system, one White Net Control Point mobile battle management and observation system, and two short range combination anti-aircraft artillery gun and surface-to-air missile systems.

The TSMO has also supported PM AEC with the development of the ASET IV Threat Module. This system creates a simulated, realistic electronic warfare environment to assist Army Aviation crews, teams, and units in maintaining tactical proficiency. The prototype ASET IV Module was fielded by STRICOM to the National Training Center in 1993 and is the primary air defense asset for the Opposing Forces training units at the NTC. These systems clearly are bringing great cost savings and training improvements to Army Aviation.

Under the direction of PM CATT, we are pursuing efforts to accelerate the development and acquisition of the Aviation Combined Arms Tactical Trainer (AVCATT). AVCATT will develop simulators which replicate Army attack, reconnaissance and transport helicopter performances and link them into the same simulated battlefield that ground-based forces will use. Presently the program includes AH-64, RAH-66, CH-47, OH-58D and UH-60 helicopters. AVCATT will allow aviation units to

train alone or be linked into a complex computerized battlefield. It will be interoperable with the Close Combat Tactical Trainer (CCTT) which simulates the M1 Abrams tank, the Bradley Fighting Vehicle, and several other ground vehicles. By expanding CCTT to include aviation, we will enhance training beyond ground forces to help create a better understanding of the total combined arms battlefield with support assets. The bottom line will be a better trained Aviation Force with incredible cost savings.

PM DIS leads STRICOM's involvement in reshaping Force XXI through the evolution of the synthetic environment demonstrated in the Synthetic Theater of War (STOW). Combining live and virtual forces on the synthetic battlefield saves the services countless thousands of dollars. During the Atlantic Resolve exercise, STOW-Europe clearly demonstrated the power of simulation. STOW allows every soldier and weapon system to transmit digitally to a central processing center and gives commanders distinct information about their personnel which can be used to improve training.

The Aviation Digitization Laboratory (ADL) will portray the power of Aviation in the Army's battle command process by modeling the digital links of the integrated battlefield of the future. Longbow Apache and Comanche will be the cornerstone systems enabling Aviation's seamless digital connectivity with other members of the combined arms team.

The USAAVNC ADL will integrate existing simulations and simulators into the Army's Aviation Test Bed. This PM DIS and STRICOM-led integration effort will create a DIS compliant, Corps level synthetic battlefield environment capable of real time interface with advanced sensors, intelligence processing elements, command and control nodes, and advanced aircraft sensors. As the ADL and the synthetic battlefield mature in scope and functionality, both will continue to play an ever-increasing role supporting the vision and execution of Force XXI.

We must continue to focus our energies and shrinking resources to expand our horizons beyond what is conceivable today to what we will dream about tomorrow. STRICOM's mission and vision will guide our great soldiers and aviators through the maze of synthetic environments which will lead to FORCE XXI and the best trained force ever.

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BG Michitsch is the Commanding General, Simulation, Training, and Instrumentation Command (STRICOM), Orlando, FL.

AAAA Annual Essay Contest

The third Annual AAAA Essay Contest is underway. The contest is designed to encourage the writing of original essays on topics that further the general knowledge of U.S. Army Aviation. Suspense date is **1 July 1995**. First prize earns $500; second prize, $300; third prize, $200. Application forms can be attained from the AAAA National Office, 49 Richmondville Ave., Westport, CT 06880-200; Tel. (203) 226-8184, FAX: (203) 222-9863. The three winning essays will be published in ARMY AVIATION Magazine.

ARMY AVIATION'S SIMULATION REQUIREMENTS CAPSTONE

How this document helps to ensure Army Aviation's success in Force XXI.

A significant step was taken on June 1, 1994, when the Commanding General of the United States Army Aviation Center (USAAVNC) signed Army Aviation's Simulation Requirements Capstone. The capstone was in response to a need to identify, in one document, Army aviation simulation requirements that support the three simulation domains: research, development, and acquisition (RD&A) process; advanced concepts and requirements; and training exercises and military operations.

The capstone requirements document was the result of over two years of dedicated work by action officers throughout Army aviation, initiated by the vision of the USAAVNC Commanding General in March of 1992 when he created a Directorate of Simulation. The assigned mission was to develop a Training Aids, Devices, Simulators, and Simulations (TADSS) strategy that would be a road map for the acquisition of necessary TADSS to support all future aviation requirements. Although it would be impossible to congratulate every member of the aviation team for a job well done, special laudes must be given to LTC George Welch. Because of his dedicated leadership, vision, and initiative, the document was written, staffed, and signed in less than two months.

The utility of the strategy became immediately apparent. Included as an integral part of the Aviation Force XXI Campaign Plan, it provided the simulation framework for preparation of the branch's participation in several high visibility exercises such as Prairie Warrior 95, Focused Dispatch, and Synthetic Theater of War-Europe (STOW-E). At the recent laydown of all TADSS across the Battlefield Operating Systems (BOS) at Training

and Doctrine Command headquarters, it was recognized as a model for others to use to define and integrate requirements. Most importantly, if executed properly, it will provide the thrust and direction to develop and acquire state-of-the-art TADSS to support future aviation requirements across the spectrum of distributed interactive simulation (DIS).

Some basic tenets were used to build the strategy:

- Focus on the future as outlined in the Army Aviation Modernization Plan (AAMP).
- Integrate system, non-system, and RD&A simulation programs to complement each other while leveraging scarce resources.
- Expand individual and crew training focus to include combined arms/joint collective training and mission rehearsal.
- Prepare the Aviation Testbed (AVTB) for future Advanced Technology Demonstrations (ATDs), virtual prototyping, and Advanced Warfighting Experiments (AWEs).
- Leverage the upgraded AVTB; Army Research Institute, Simulator Training Research Advanced Testbed for Aviation (STRATA) facility; Aviation Warfighting Simulation Center; Cellnet; and available training simulators at USAAVNC as training developmental tools for the Aviation Combined Arms Tactical Trainer (AVCATT) and other future training tools.
- Take advantage of technological advances and concepts such as reconfigurable cockpits, common semi-automated forces, computer hardware, and reusable software.

Upgrades to the AVTB are obviously important pieces of the overall simulation requirements and, in fact, the requirement to specify details was a driving force in the tasker to "pull together into one document" what the user really needed. A follow-on to the capstone has been the further definition of an aviation digitization laboratory (ADL) that will integrate existing simulations into the AVTB to provide a corps/division size constructive/virtual, electronic battlefield capable of real time interface with battlefield sensors, command and control nodes, and advanced aircraft manned simulators.

The foregoing will operate within the AVTB on a DIS local area network, upgraded to accommodate digital communication, and be capable of participating in networked exercises via the Distributed Simulation Internet. The ADL work has been pioneered by Lieutenant Colonel Rick Gill and Mr. Steve Ochsner whose vision and dedication will provide Army aviation with a world-class simulation facility to support the development of the digitized battlefield.

Resourcing is a significant challenge as dollars are reduced, requiring sound, innovative program management based on clear, focused requirements. Common sense and fiscal realities call for a consolidated TADSS strategy. Explorations of technology that would make the development of systems for any aircraft

(CAPSTONE — continued on p. 30)

PEO AVIATION SIMULATION INITIATIVES

Not just another pretty face and definitely not an "Eighth Air Force", Army Aviation of the 21st Century will incorporate technologies that focus the explosive power of the Combined Arms Team at the right time and the right place — just as a magnifying glass focuses the destructive potential of the sun.

The Aviation Warfighting Cell, Kiowa Warrior Training Devices, and Army Airborne Command and Control Systems.

The stealth of Comanche, the lethality of Longbow Apache, the digitized information transfer capability of the Army Airborne Command and Control System — collectively, these systems will revolutionize the implications of the cliché, "shoot, move, and communicate".

PEO Aviation is responsible for numerous efforts in the area of Training Aids, Devices, Simulators and Simulation. Three in particular will play a significant role during preparation for Force XXI.

The Aviation Warfighting Cell. The Aviation Warfighting Cell (AWC) comprises Longbow Apache and Comanche manned simulators. Sponsored by PEO Aviation, AWC components will be integrated by the Aviation Research, Development, and Engineering Center (AVRDEC), and incorporated into Ft. Rucker's Aviation Test Bed by the Simulation, Training, and Instrumentation Command (STRICOM).

Verification and validation by the U.S. Army Materiel Systems Analysis Activity will ensure the accurate simulation of flight performance, handling qualities, mission equipment package capabilities, and survivability characteristics. AWC participation in Advanced Warfighting Experiments and Advanced Technology Demonstrations will provide design and/or product improvement feedback to the respective Program Managers. AWC components include:

AH-64D Longbow Apache Player

Station (LPS). Produced by Serv-Air, Inc. and McDonnell Douglas Training Systems, this single seat collective trainer will have the capability to replicate the front seat or back seat of the AH-64A/A+/D. A second crew station will be replicated using a four monitor Station Director. The LPS is the front runner to the Longbow Crew Trainer System scheduled for fielding with the AH-64D Longbow Apache in 2002. LPS features include:

- Full Mission Equipment Package
- Full Fidelity Flight Control Heads
- Full Fidelity Optical Relay Tube Grips
- ESIG 3000 Image Generator
- Out-the-Window and Sensor Views.

Comanche Player Station (CPS). Comparable to an individual skills trainer, this dual crew cockpit produced by Sikorsky Aircraft will replicate the front seat and back seat of the RAH-66 Comanche. Simulator features will include:

- Full Mission Equipment Package
- Full Fidelity Cockpit
- ESIG 3000 Image Generator
- Dome Visual System for Out-the-Window Views.

Cell Manager. Cell Manager functions will be provided by the Interactive Tactical Environment Management System (ITEMS). ITEMS is a cost-effective, off-the-shelf, integrated software system that creates, runs, and monitors the synthetic tactical environment (e.g., electronic battlefield). ITEMS provides interactive air and ground entities (automated and semi-automated friendly and opposing forces) and supports command and control authority structures. Cell Manager features include:

- Real Time Scenario/Battle Environment
- Intelligent, Configurable, Interactive Computer-Generated Forces
- Stealth Viewing (e.g., magic carpet)
- Data Collect/After Action Review
- Interfaces to Terrain Databases
- DIS 2.0.3 Compliant
- Defense Simulation Internet Gateway Software.

AWC will be fully verified and validated and available to support Advanced Warfighting Experiments in the summer of 1995.

OH-58D Kiowa Warrior. Bridging the gap until the arrival of Comanche, the Kiowa Warrior will see action as part of Force XXI. Two simulation development efforts are underway.

Eight Cockpit Procedures Trainers will be delivered to Ft. Rucker, AL to support the Aviator Qualification Course (AQC). These devices will be used to train pilot, copilot, and maintenance test pilot tasks. Although a lower fidelity simulation device, the reduced AQC flight hour requirements alone will save an estimated $8 million dollars annually.

Sustainment training for aviators in operational units will be supplemented at company/troop level by the Crew Station Mission Equipment Trainer. Intended as a desk top trainer, it is envisioned that it will incorporate touch screen technology and be designed to address training requirements for perishable skills in the area of crew coordination and mission equipment package operation. Fund-

ing for development starts in 1996.

Army Airborne Command and Control System (A2C2S). Operating in the third dimension above the battlefield, the commander will have "on the move" command and control capability through employment of the A2C2S. By providing unprecedented access to all categories of available intelligence information, A2C2S will facilitate near real-time situational awareness, support rapid decision making during the chaos of battle and allow the commander to penetrate the fog of war.

The production version will be installed in a UH-60A/K. Onboard equipment will include Global Positioning System, High Frequency Nap-of-the-Earth Radio, Improved Data Modem, Aviation Mission Planning System, and Have Quick II. Prototype components of A2C2S hardware and software will be integrated into Ft. Rucker's Aviation Test Bed. This equipment will be used to demonstrate digital transmission of intelligence overlays, tactical operations orders, reconnaissance reports, fire support missions, mission planning, and command and control functions.

The transition to Force XXI brings inherent risks and requires bold changes in the way we think about warfighting. Cost effective demonstration executed in an efficient, orderly manner will reduce risk and ensure that our shrinking budget dollars are spent on worthwhile endeavors.

★★

LTC Walsh is the Assistant PM, Simulation, Aviation Electronic Combat PMO, St. Louis, MO.

CAPSTONE

(Continued from Page 27)

or weapon system better, cheaper, or quicker is essential. The capability to simulate both fielded and developmental aviation systems on a realistically portrayed modern synthetic battlefield is a requirement now. These synthetic battlefields must represent the full dimension of ground, air, maritime, and space operations across the entire spectrum of conflicts from full mobilization to operations other than war.

The synthetic battlefields must include forces, units, systems installations, logistics networks, terrain, environmental, cultural features, and people representative of the environment of a Force XXI. The tactical and natural environment supporting DIS must specifically include mature databases with realistic simulation of a modern battlefield.

Complementing data bases supporting the full spectrum of day, night, weather, obscurants, low observable technology, digital and voice communications, navigation, and the complete electromagnetic spectrum of infrared, electronic warfare, and radar must be integrated into these terrain databases. All of this is needed to help ensure that Army aviation's potential becomes a reality in our Army's Force XXI.

★★

COL Penny is the Director of Training, Doctrine, and Simulation, U.S. Army Aviation Center, Ft. Rucker, AL.

TADS BORESIGHT: MORE THAN JUST A BASE TASK

An AH-64 arrives in a firing position. It is 0300 hours and illumination is four percent. The crew observes two T-80 tanks at 3,500 meters. Crew coordination is flowing and the Co-pilot/Gunner (CPG) launches two Hellfire missiles. The first missile impacts ten meters to the left front of the target.

How proper conduct of a routine task can lead to the difference between a dead target and a live threat.

The CPG keeps the line of sight reticle on the target, and the second missile impacts in the same place as the first. An M1A1 to the right front of the aircraft fires two sabot round in 20 seconds and destroys both T-80 tanks. What is the difference in the two engagements? The difference is the emphasis tank crews and the Armor Community put on boresight procedures.

After surviving the egress, the night desert landing in the FARP followed by a night desert landing in the assembly area, not to mention the encounter with the enemy, the crew remembers:

NOTE: Failure to accurately perform the boresight procedure may result in the laser and selected weapons impacting other than where the selected sensor is pointed.

The Target Acquisition Designation System (TADS) boresight is more than reading a checklist and manipulating switches. It requires a plan. The plan is briefed and rehearsed. The battalion, each company, and the FARP must have a coordinated plan. The plan includes targets, target locations, responsible leaders, and disciplined crews. Each component is equally important.

Boresighting is a two-part procedure, internal and outfront. Because the internal boresight does not require external support, this

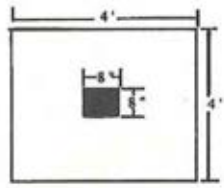
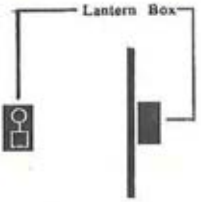


Figure 1 Front View



Side View

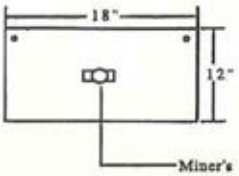
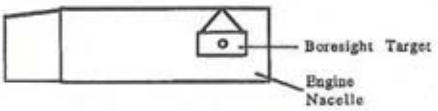


Figure 2



article focuses on the outfront boresight.

The first component of the plan is the target. The boresight target must be clearly visible using the Forward Looking Infrared (FLIR) and Day Television (DTV). The target has a co-located heat and light source. The target is durable and capable of functioning in adverse environmental conditions (i.e., winds). There are many variations to boresight targets. I will discuss two that work well.

The first target works well in an assembly area or FARP. It is a 4'x4' piece of plywood painted white. Cut an 8"x8" square out of the center. The Sheet Metal Shop will build a box that will hold a propane or gas mantle lantern (unit equipment). Attach the box to the back of the panel so the lantern is visible through the square hole. Make the attachment temporary so the box is removable for transport and storage. The large white panel is easy to identify in the daytime and the lantern provides a co-located heat and light source. To use it, mount it on the ground or on a truck.

The second target is an idea provided by CW3 Dan Craytor, 1-227th AH-64 SP, IE, Master Gunner. It is a "quick use" boresight target transportable in an aircraft. The target is a 12"x18" piece of plywood painted white with a light in the center (miner's light,

available at local electronics shops, $4.99, requires two AA batteries). Drill small holes in the top corners for a mounting rope or wire. To use the panel, hang it over a warm engine door. This gives you a co-located light and heat source. Use the present position of your aircraft and the boresight aircraft to determine range. Of course, you must remove the boresight target before flight.

The second component is target location. Place the target so it is visible with the TADS and meets the following range criteria for boresight procedures:

- the target must be no closer than 500 meters from the aircraft;
- if the target range is between 500 and 1,500 meters, the range must be accurate within ten meters;
- if the target range is between 1,500 and 5,000 meters, the range must be accurate within 50 meters, and;
- if the target range is greater than 5,000 meters, the range must be accurate within 100 meters.

There are several methods of obtaining range to the target. Laser range is the easiest, but it is not always an available method. NAV range is another simple method. Doppler, present position, and accuracy effects NAV range accuracy. Use GPS if available (most units have GPS) to confirm present position and location of the boresight target. Another option is entering target and aircraft location into the GPS. It will compute manual range. Knowing the target and aircraft location, you can also compute the range manually by using the following steps:

- Determine the easting and northing of both grids.
- Square each of the differences and add them together.
- Take the square root of this value and multiply it by ten.

This is the distance between the target and aircraft. An example follows to clarify my explanation.

Target Grid: NK57251713
Aircraft Grid: NK58301835

(a) 5,725 1,713
-5,830 -1,835
105 122

(b) (105x105)+(122x122)=25,909

(c) Square root of
25,909=160.96x10=1,609.6

These calculations are simple. Most aviators can perform these functions on their watches or pocket calculators.

The third component is the Boresight Plan. This requires coordination at the battalion level to deconflict terrain. The first step in developing the plan is designating a boresight planner and target operator.

The boresight planner is a part of the company planning cell. He is responsible for target placement, aircraft positions, and briefing the plan. The planner insures the target is placed so it meets range criteria and is visible through the TADS of all aircraft. He determines present

position of the aircraft and target with GPS or Doppler. A technique for the planner is to write target and aircraft location on a 3x5 card and place it on the front seat of the aircraft. This gives crews data necessary to boresight any assigned aircraft. The planner is responsible for briefing the target operator on the mission timeline. The company first sergeant equips the target operator to perform his mission.

The target operator is a dependable individual with the information and resources to perform his mission. His tools should include, but are not limited to, the following: target with components, dedicated vehicle during mission, night vision devices, GPS (if required), compass, chem lights, communication capability with aircraft, spare lantern mantles, extra propane bottle or white gas, lighter/matches.

The target operator places the target temporarily or semi-permanently. If you are flying several missions out of the same assembly area and threat conditions permit, place the target semi-permanently. If not, the target operator will place it before every mission. These two factors determine the need for a vehicle and GPS. It is very important that the operator is able to find the target at night if it is set up semi-permanently. The time to discover that the operator cannot find the target or that an aircraft cannot acquire it is not 15 minutes before launch. With a boresight brief and proper resources, the target operator ensures the crew is able to execute the plan.

Conduct a rehearsal to identify shortcomings in the boresight plan. During the rehearsal, all aircraft conduct the boresight procedure.

Outfront boresight is an easy task. It is the plan that requires some thought. Train using your plan during field training exercises and battle drills. Most airfields have boresight targets permanently established. Use it before each training flight. Boresight for a gun pilot should be as common as a hover power check.

An AH-64 crew executes their boresight plan and departs on a mission. The AH-64 arrives in a firing position and observes two T-80 tanks at 3,800 meters. The CPG launches two Hellfire missiles. Both missiles destroy their targets. The crew understands accurately performing the boresight procedure results in laser and selected weapons impacting where the sensor is pointed.

The mission of the Apache is to kill tanks. A properly boresighted aircraft, a trained crew, and a good tactical plan enable us to accomplish that mission. Attack!

★★

CPT Coffman is the Eagle Team Attack Company Trainer, National Training Center, Ft. Irwin, CA.

BY DR. JOHN W. KITCHENS

ARMY AVIATION AND THE HELICOPTER V: THE H-21 SHAWNEE, PART 1

The fifth in a series of articles reviewing historic aircraft's impact on Army Aviation.

One of the helicopters that symbolized Army Aviation during the late 1950s and early 1960s was the H-21 Shawnee, the Army's first cargo helicopter according to the classification system adopted in 1954. In previous articles in this series I focused on the H-13, the H-23, and the H-19. The Army continued to use these aircraft for training and other purposes through the 1960s, but they were clearly overshadowed during the period between the Korean and Vietnamese conflicts by the H-21 and other cargo helicopters, both in the development of tactics and doctrine and in official and unofficial publicity.

In 1962, aircraft nomenclatures changed throughout the U.S. military services. At that time the H-13, H-23, H-19, and H-21 became the OH-13, OH-23, UH-19, and CH-21 respectively. Also in 1962, the mission category of the Shawnee became "utility tactical transport helicopter". I will refer to the Shawnee as the H-21 and as a cargo or transport helicopter throughout this article.

Development and Testing. The tandem-rotor H-21, a precursor in several respects to the CH-47 Chinook, was the most successful helicopter developed by Frank N. Piasecki. Piasecki had formed a company to design and build helicopters before World War II. In 1943 the company was incorporated as the P-V Engineering Forum, and in April of that year, Piasecki completed and demonstrated the second helicopter to fly in the United States, the PV-2.

During the latter part of World War II, some of the military services requested that industry develop larger helicopters than any that had been designed up to that time, for use in sea rescue operations. Frank Piasecki proposed a tandem-rotor configuration to meet the requirement and

signed a contract with the Navy on 1 January 1944 to produce an experimental model. He conducted the first tandem-rotor-helicopter flight in March 1945 in his "Dogship", which, although only a skinless frame, bore a striking resemblance to the later H-21.

Two years later, the Piasecki Helicopter Corporation began delivering fabric-covered HRP-1 helicopters (an early version of the H-21) to the Navy and Coast Guard. The Navy acquired a total of 26 HRPs between June 1947 and December 1950, and Piasecki developed an improved, metal-covered version (the HRP-2) especially adapted for amphibious assault missions being planned by the Marine Corps. The Navy and Coast Guard used the HRP for search and rescue as well as for anti-submarine warfare and mine sweeping experiments. Because of the curve in the fuselage that permitted rotor blade clearance, the uniquely shaped helicopter was nicknamed the "Flying Banana" shortly after initial delivery.

The first nine Piasecki HRP helicopters were delivered to Marine Helicopter Squadron One in August 1948. The Marine Corps had commissioned the squadron in December 1947, with the two-fold mission of evaluating helicopters and developing techniques and tactics for the movement of assault troops in amphibious operations. In May 1949, the squadron conducted demonstrations of amphibious assault with helicopters for members of Congress and senior Defense Department officials. In 1950, after participating in Operations PACKARD III and IV, the squadron demonstrated various amphibious assault tasks for President Harry S. Truman and the Joint Chiefs of Staff.

Army Procurement Problems. Largely because of rivalry between the Army and Air Force over the role and mission of Army aviation and the Army's dependence on the Air Force for aircraft procurement, the Army was unable to develop a helicopter force for several years. The Army did not receive its first allocation of 21 H-19C helicopters until late summer of 1952 and did not obtain any of the larger Piasecki cargo helicopters until September 1954.

According to the Key West Agreement of 1947 and subsequent Army and Air Force joint regulations, the Air Force was responsible for research and development and procurement of Army aircraft and also for the aerial transport of troops and aerial supply to the Army. Furthermore, the weight of Army helicopters was not to exceed 4,000 pounds when empty. These agreements and regulations unquestionably supported the position of the Air Force in its refusal to procure cargo helicopters for the Army, even when Army funds were authorized.

The reality of the situation, however, was that the Air Force had been relatively uninterested in helicopter development and had been especially negligent in the development and procurement of helicopters for the purpose of supporting the Army. For the Air Force, the helicopter was almost exclusively a search and rescue vehicle. At least partially as a result of the

failure of the Air Force to develop helicopters to support various Army requirements, many Army leaders came to believe that organic Army control of its own aerial support was necessary for the successful development of aircraft and tactics to perform this function.

In order to create its planned helicopter transport companies, the Army requested in 1950 that the Air Force agree to remove restrictions on size and use of Army aircraft. Only after this request was received did the Air Force begin to plan the creation of air assault helicopter squadrons; the stated purpose of the squadrons would be to prevent the Army from usurping this Air Force function. By the time these Air Force squadrons were organized and prepared to support the Army several years later, however, Army leaders interested in helicopter assault had become determined to employ Army helicopters rather than rely on the Air Force.

In response to unrelenting pressure from Army leaders during the early months of the Korean conflict, the Air Force agreed in February 1951 to purchase and allocate to the Army "on an experimental basis" the 72 H-19s and 33 H-21s that the Army had requisitioned. In August 1951, however, the Air Force reneged on this agreement, on the grounds that it violated the existing restrictions on the size and use of Army organic aircraft.

Agreements of 1951 and 1952. Continued Army insistence on its require-

ment for cargo helicopters led to a memorandum of agreement between the secretaries of the Army and Air Force, signed in October 1951. This agreement abolished weight limitations on Army aircraft and authorized the Army to employ its aircraft for the "transportation of Army supplies, equipment, and small units within the combat zone". This agreement recognized, however, "that the Air Force was assigned the *primary function* of supplying the necessary airlift to the Army."

Disagreement over the implication of the "primary function" clause of the 1951 accord further delayed the Army's being provided with cargo helicopters. Air Force spokesmen contended that, since the Air Force was *primarily responsible*, it should provide itself with sufficient helicopters for short-range aerial transportation *before* procuring any for the Army. In 1952, the Secretary of Defense intervened in the dispute — to a large extent on the side of the Army. Accordingly, a new Army-Air Force memorandum of agreement was signed in November 1952. Although this agreement established a weight limit of 5,000 pounds for the Army's fixed-wing aircraft, there were no weight limits for Army helicopters. Army aircraft were clearly authorized to transport men and materiel and conduct aeromedical evacuation within the combat zone without any indication of the Air Force's being primarily responsible.

The Army, however, was effectively denied authority to follow the example of the Marine Corps in the development of vertical envelopment or air assault. The 1952 agreement assigned to the Air Force the responsibility for "the air movement of troops, supplies and equipment in the assault and subsequent phases of airborne operations" and also for the "airlift of Army supplies, equipment, personnel and units from exterior points to points within the combat zone." The combat zone was defined as normally being from 50 to 100 miles deep.

Additionally, the Army-Air Force agreements of 1951 and 1952 left the Army dependent on the Air Force for aircraft procurement; this arrangement enabled the Air Force to purchase scarce helicopters for its own use rather than to fill Army requirements. With regard to the H-21, there was a real problem of availability; the Piasecki Company was unable to produce the aircraft fast enough to meet all military requirements until the mid-1950s.

The Marine Corps had tested the Piasecki HRP helicopter and found it to be appropriate for use as an assault helicopter. Faced with a delay of several months in acquiring an adequate quantity of Piasecki helicopters to equip first Marine helicopter transport squadron, however, the Marines selected the more readily available Sikorsky S-55 (the Army and Air Force H-19). The Marine Corps began receiving the Sikorsky aircraft in April 1951 and used it in vertical envelopment missions in Korea.

The Air Force selected the Piasecki H-21A (based on the Navy and Ma-

rine Corps HRP-2) for its high altitude arctic rescue helicopter and then acquired the Piasecki helicopters as they became available. The Air Force purchased a total of thirty-eight H-21As — 32 for the Air Rescue Service (mostly for use in the arctic) and six for Canada, under the auspices of the Military Assistance Program.

As the more powerful H-21B became available in 1953, the Air Force ordered it for service with the Troop Carrier Command as an "assault transport" to furnish support to the Army. The Air Force acquired a total of 163 H-21Bs between 1953 and 1955. Around 40 of these had been accepted by the Air Force prior to 1954, when delivery almost halted for around six months because of the grounding of the aircraft resulting from an accident in Canada. Production continued, however, and deliveries resumed during the latter part of the year.

Army Transportation Helicopter Companies. The joint Army-Air Force regulations of 1950 that recognized the Air Force's responsibility for the procurement of Army aircraft and spare parts also placed the Air Force in charge of depot maintenance of Army aircraft. Within the Army, the Ordnance Corps had responsibility for the logistical support of Army aircraft below the depot level and for coordination of other aviation matters with the Air Force.

Beginning in 1950, senior Transportation Corps officers began to take a very active interest in the procurement of cargo helicopters and the creation of transportation helicopter companies. In 1951, Transportation was authorized to organize five transport helicopter companies. Aviation-minded Transportation Corps leaders succeeded not only in organizing and training transportation helicopter companies but also in negotiating with the Ordnance Corps an agreement transferring below-depot-level support of Army aircraft from Ordnance to the Transportation Corps. The agreement, announced in August 1952, provided for a gradual transfer of this responsibility; the transfer was substantially completed by March 1953. The Transportation Corps then established an aviation maintenance training program at Fort Eustis, VA.

The Army began receiving Sikorsky H-19 helicopters during the latter part of 1952. They were used to equip the transportation companies already organized and partly trained — namely, the 6th, the 13th, and the 506th.

Over two more years passed before the Army obtained its first Piasecki H-21, but in 1953 the Air Force began procuring a smaller tandem-rotor Piasecki helicopter for the Army. This helicopter, almost identical to the HUP-2 then being produced for the Navy, became the H-25A Army Mule. The HUP line of helicopters was developed by Piasecki in response to a Navy requirement for a compact helicopter that could fit into carrier elevators without folding the blades. Deliveries of the HUP aircraft were made to the Navy from February 1949 to July 1954.

The Army acquired 70 H-25As in

1953 and 1954. The H-25 had an empty weight of 3,928 pounds and a normal loaded weight of 5,750 pounds. It had a cruising speed of 80 knots and a maximum range of approximately 340 miles. Its normal useful load capacity of 1,822 was considerably less than half that of the H-21. Furthermore, both the useful load capacity and the range of the H-25 were less than those of the Army's other cargo/utility helicopter, the Sikorsky H-19.

The 509th Helicopter Transportation Company was one of the first Army units to be supplied with H-25s. The Army used this aircraft to transport personnel and light cargo, as an ambulance, and later for tandem-rotor transition training. Not having been designed for the Army, however, the H-25 was not particularly satisfactory and came to be considered obsolete for Army purposes shortly after acquisition. Fifty of the seventy H-25s procured were turned over to the Navy beginning in 1955, and the aircraft was totally removed from the Army inventory during the early part of 1958. In 1956 the 509th was redesignated the 3rd Transportation Company (Helicopter) and provided with H-21s.

H-21s for the Army. In June 1954 the Operations Research Office of Johns Hopkins University published a study of helicopter operations during the Korean conflict. The report was authored by Harry S. Pack, a vice president of the Piasecki Helicopter Corporation. It was a detailed and analytical study of helicopter operations, maintenance, and supply by the various military services and was apparently impartial, with the caveat that Pack was understandably interested in the increased military use of helicopters.

The first four of the six major recommendations of Pack's study related to the remaining restrictions on the Army's procurement and use of helicopters and its continuing dependence on the Air Force in matters relating to helicopters. These were as follows:

- Permit the Army to use helicopters for airborne assault missions as well as for transport and medical evacuations;
- Terminate the dual service responsibility for maintenance and establish separate maintenance and supply systems within the Army;
- Permit the Army to completely take over its own helicopter pilot and mechanic training program;
- Consider permitting the Army to establish its own helicopter procurement program.

Although none of Pack's recommendations was accepted by the Department of Defense immediately, all of them became standard practice within a few years.

While I have not been able to establish any causal relationship, it is interesting that the Air Force began procuring H-21s for the Army shortly after the release of Pack's report. The Army formally accepted its first H-21 at the Piasecki Helicopter Corporation plant at Morton, PA, on 20 August 1954. MG Paul F. Yount, Chief of the Army Transportation Corps, accepted the aircraft for the Army and flew as co-pilot on the flight of the

first Army H-21 from Morton to Philadelphia International Airport. The H-21s obtained by the Army were C models with increased troop capacity over the H-21B and a 4,000 pound-capacity cargo sling.

The Air Force had dubbed the H-21 as the "Work Horse", and the sobriquet was continued by the Army, although the Army H-21 was officially named Shawnee and also continued to be referred to colloquially as the "Flying Banana". By June 1955, the Army had accepted over two dozen H-21Cs, and the Work Horse had been assigned at Camp Rucker, AL, Fort Riley, KS, Fort Bragg, NC, and Fort Huachuca, AZ.

The Army procured Shawnees from 1954 to 1959. They were brought into the Army inventory rapidly during 1956 and 1957, after the Air Force discontinued purchasing them for its own use. By March 1957, the Army had 210 in its inventory; by December 1957, it had 301. A peak number of 308 was reached in 1958, and around 300 remained in the inventory for several years thereafter. The Army procured a total of 334 H-21Cs and an additional 16 or more surplus H-21Bs from the Air Force. Most of the H-21Bs were brought up to H-21C standards.

The single-engine H-21C could carry 20 troops with a crew of two or 12 litters with a crew of three. It was designed to carry a basic mission cargo of approximately 3,268 lbs. and a maximum cargo of 4,186 lbs. The helicopter was powered by one 1,425 horsepower, nine-cylinder Wright R-1820 radial engine. Each of the three-blade rotors was 44 feet in diameter. The empty weight was 8,000 pounds, the gross weight was 13,300, and the maximum take off weight was 15,060. The cruising speed was 98 miles per hour and the maximum speed at sea level was 131. The maximum range was 397 nautical miles, and the service ceiling was 18,600 feet.

Transition Training. In April 1954, in preparation for the acquisition of H-21s, the Army organized the 93rd Helicopter Transportation Company and the 80th Helicopter Field Maintenance Detachment within the 71st Helicopter Battalion at Fort Riley. Several H-25 helicopters arrived the following July and were used to train Army pilots in the operation of tandem-rotor aircraft until H-21s became available. The first H-21s arrived at Fort Riley in October, and by mid January 1955, the 93rd had acquired 12 of the Work Horses. These first H-21s were used at Fort Riley for transition flight training of pilots from other stations before the pilots were sent to the Piasecki plant to pick up their own aircraft.

On 1 August 1955, The Army Aviation Unit Training Command (AAUTC) was activated at Fort Riley for the purpose of conducting pilot transition training for tandem-rotor helicopters and also to train pilots for the U-1 Otter, a fixed wing Army cargo plane. A similar unit was activated at Fort Sill, OK, to provide transition training for single-rotor helicopters. The AAUTC at Ft. Riley was discontinued in 1958, but a chief

warrant officer from the former training unit continued to supervise standardization in the H-21 at Ft. Riley. An H-21 transition course was subsequently instituted at Ft. Rucker.

A procedure trainer for the H-21C was evaluated at Fort Rucker in 1957. The purposes of the trainer were to teach pilots in transition from single to tandem-rotor helicopters complete cockpit checks, engine start procedures, and correct engine and rotor transmissions gauge indications and to allow them to become familiar with the sound and feel of the H-21C with engine running and rotors engaged. From 1958 to 1962, the H-21 was one of the helicopters used as instrument trainers at Fort Rucker. Helicopter transportation companies that were given tandem-rotor training and equipped with H-21s included the 93rd, 57th, 8th, 6th, 3rd, 153rd, 33rd, 65th, 120th, 98th, and 80th.

At a meeting of the Board of Directors of the Piasecki Helicopter Corporation, in April 1955, Don R. Berlin, the company president, was elected chairman of the board, supplanting Frank Piasecki. Piasecki was left with no authority other than being a member of the board and of the executive committee of the board. In 1956, he formed a new company, and the old Piasecki Helicopter Corporation, which retained responsibility for manufacturing the H-21, was renamed Vertol Aircraft Corporation. Vertol became a division of Boeing Aircraft in 1960.

Exercise SAGE BRUSH. In 1955, Army as well as Air Force H-21s were used in Exercise SAGE BRUSH, the largest U.S. field exercise since World War II up to that time. Exercise SAGE BRUSH, consisting of a simulated nuclear attack and the U.S. response, was conducted jointly by the U.S. Continental Army Command and the Air Force Tactical Air Command. The exercise took place in Louisiana during the months of November and December.

Twenty-one Army H-21Cs and 23 Air Force H-21Bs were used in Exercise SAGE BRUSH. Fourteen of the Army helicopters were assigned to a provisionally organized sky cavalry troop, consisting of land and air reconnaissance elements, and made part of the Aggressor forces. The other seven Army H-21s were assigned to the 8th Transportation Battalion (Helicopter). This unit was part of the U.S. forces and performed the normal mission of tactical and logistical support to other combat units in accordance with approved doctrine.

The 23 Air Force H-21Bs were assigned to the Tactical Air Command's 516th Troop Carrier Group. Although billed as the Air Force's "first rotary wing assault group", the 516th performed logistical support missions for the most part; these included transportation of control teams and medical personnel, medical evacuation, search, training, and logistical transport. The H-21s performed well, and aerial resupply proved to be particularly beneficial after heavy rains impeded access to some areas of the combat zone.

The principal innovation in the

development of Army helicopter tactics and doctrine that occurred during Exercise SAGE BRUSH was the Army's sky cavalry operations. The exercise followed the publication and extensive circulation of MG James M. Gavin's article, "Cavalry, and I Don't Mean Horses", calling for the use of helicopters, along with armor, in cavalry operations. "Even the most casual awareness of the historical lesson," MG Gavin wrote, "should suggest that in ground combat the mobility we lack will be found in the air vehicle." Gavin's article was reprinted in other magazines and was both widely read and influential. By the time of Exercise SAGE BRUSH, the Army was firmly committed to the testing of the air cavalry concept.

At the time of the exercise, however, the commander of the Air Force Tactical Air Command, General O.P. Weyland, attempted to block the Army's use of helicopters in testing the air cavalry concept. The Army leadership appealed the issue to the Secretary of the Army, who convinced the Secretary of the Air Force to permit the tests to be conducted. The results of the tests were inconclusive, and in some respects disappointing, but further experimentation was indicated and the essential elements of the concept were evaluated as sound.

Except for the limited and not entirely successful use of air cavalry, both the Army and the Air Force used helicopters during Exercise SAGE BRUSH for essentially the same purposes for which they had used them during the Korean conflict and for transporting control teams, photographers, and other personnel involved with the conduct of the exercise. Helicopters were not used to their maximum potential in this operation. Although the Air Force had organized and equipped an assault transport helicopter group (in order to prevent the Army from doing so), it was not used for its ostensible purpose. While the Air Force was determined that Army helicopters not be used in joint airborne operations, the Army was equally determined that its troops not be transported by Air Force helicopters operating under Air Force control in such operations.

Although some Army leaders were thinking in terms of the tactical combat use of helicopters and the Army was beginning to make progress in the development of air cavalry doctrine, the Army and the Air Force in general had not reached the point that the Marine Corps had reached in its vertical envelopment operations conducted prior to and during the Korean Conflict. Army-Air Force rivalry and perhaps some inertia in the Army itself continued to hinder progress in the development of air cavalry and air assault doctrines.

Secretary of Defense Directive of 1956. The controversy over the role and mission of Army helicopters

and other disputes between the Army and the Air Force in 1955 and 1956 led to the promulgation of a directive by the Secretary of Defense in November 1956. This directive made significant modifications in the 1952 Army-Air Force memorandum of agreement. For example, the depth of the combat zone, within which the Army was authorized to operate aircraft, was more than doubled; even more significantly, it was extended 100 miles behind enemy lines — making it possible for the Army to conduct air assault operations. While a weight limit of 20,000 pounds was established for Army helicopters in 1956, this restriction was of little immediate consequence since no helicopter approaching that size was being planned for Army use. Furthermore, the 1956 directive made both the new helicopter weight limit and the already existing 5,000 pound limit on Army fixed-wing aircraft subject to exceptions that could be authorized by the Secretary of Defense.

The Army aviation community was generally pleased with the 1956 directive, especially with the expansion of the combat zone. "For the first time," MG Hamilton H. Howze, the first director of Army Aviation, observed with regard to the directive, "Army aviation functions [were] not being challenged."

On 1 June 1956, between the time of Exercise SAGE BRUSH and the promulgation of the Secretary of Defense directive of November 1956, the Air Force Tactical Air Command ordered the inactivation of the 516th Troop Carrier Group (Assault, Rotary Wing). The Air Force's only helicopter assault group was inactivated on 9 July 1956, and its operating squadrons were redesignated as helicopter support squadrons. Although the word "support" was deleted from these squadron designations shortly afterwards, their stated missions were clearly of a support rather than tactical or assault nature after 1956. With the Air Force's backing off from its earlier insistence on providing helicopter transportation for Army assault operations and with the expanded opportunities for the Army in this area provided by the November 1956 directive, the way was open for the Army to proceed with the development of air mobility. During the early phase of this process, the H-21 would play a significant role.

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Dr. Kitchens is the Aviation Branch Historian, Ft. Rucker, AL.

Part II of this article will appear in the June issue of ARMY AVIATION Magazine.

1995 AAAA CONVENTION

The 1995 AAAA Annual Convention, held in Atlanta, GA, began on the evening of 29 March 1995 with the ribbon-cutting ceremony. Presentation of the colors marked the opening of the Professional Sessions the following morning, and MG Ben Harrison, Ret., AAAA President, delivered the AAAA Annual Report (see p. 60). Following the AAAA elections (see p. 59), MG Richard E. Stephenson, Ret., AAAA Senior VP and Chairman, AAAA Membership Committee, presented the 1994 Membership awards.

Net Member Gain winners were, below, left to right: AAAA Chapter Category (less than 80 members), Tarheel Chapter, Raleigh, NC, accepted by LTC Terry W. Benson, Chapter President; Senior Chapter Category, (80 to 169 members), Iron Eagle Chapter, Hanau, Germany accepted by the Chapter President, LTC Bruce K. Ladeira; and Master Chapter Category, (more than 170 members), the Aviation Center Chapter. COL Edward H. Littlejohn III, Chapter President, accepted on the chapter's behalf.

The Top Gun Award was won for the sixth time by MSG John H. Bae, Ret. who recruited 432 new members in 1994.

Right: Following the Presentation of the Membership Awards, MG Harrison presented COL Thomas E. Johnson, President, Colonial Virginia Chapter, with the Top Chapter Award for the second year in a row. This award goes to the chapter, regardless of size, judged to have delivered the most benefits to its members.

Left: The Honorable Togo D. West, Jr., Secretary of the Army, was the featured Keynote Speaker during Thursday's Professional Sessions and presented the AAAA Unit of the Year Awards.

Right: Secretary West joined MG Ronald E. Adams (far right) in presenting the Robert M. Leich Award to the 1st Battalion, 58th Aviation Regiment (Corps), XVIII Airborne Corps, Ft. Bragg, NC. Accepting for the unit were LTC Joseph G. Kaufmann, Jr. (second from left), Commander, and CSM Ronald W. Strahan (third from left), Senior NCO.

The Award for Outstanding Aviation Unit—ARNG went to Company G, 3d Battalion, 140th Aviation Regiment, CAARNG, Stockton, CA. Left to right: Secretary West, MAJ Kevin B. Keenan (Cdr), 1SG Charles M. Chiasson (Sr. NCO), BG William C. Bilo, Deputy Director, NGB, COL Kenneth C. Kleine, SAAO-CAARNG, and MG Adams.

Left: The Outstanding Aviation Unit of the Year Award—USAR was awarded to the 8th Battalion, 229th Aviation Regiment (Attack), 121st ARCOM, Ft. Knox, KY. From left: Secretary West, LTC James B. Blunk, Jr. (Cdr), CSM Robert C. Leffel (Sr. NCO), MG George L. Gunderman, Deputy Chief, U.S. Army Reserve Command, and MG Adams.

Right: The Outstanding Aviation Unit Award—Army was presented to the 4th Battalion, 24th Aviation Regiment, 24th Combat Aviation Brigade, 24th Infantry Division (MECH), Hunter Army Airfield, GA. From left: Secretary West, LTC Jack C. Dibrell (Cdr), CSM Karl J. Moody (Sr. NCO), and MG Adams.

Left: Thursday afternoon featured two break-out sessions. The first was presented by LTC Michael R. (Rich) Clifford, an Army Astronaut. LTC Clifford's intriguing session detailed the discoveries associated with recent Space Shuttle missions and featured some outstanding photography from his latest mission.

Right: The second break-out session was presented by COL Lawrence E. Casper, Commander, Aviation Brigade, 10th Mountain Division (Light), Ft. Drum, NY. COL Casper discussed Operations Other Than War (OOTW), specifically lessons learned from Operations CONTINUE HOPE and RESTORE DEMOCRACY.

Right: On Thursday night, the 1995 Army Aviation Hall of Fame Dinner and Induction Ceremony was conducted by LTG Robert R. Williams, Jr., Ret., Chairman, Army Aviation Hall of Fame. The following seven outstanding individuals were elected by ballot in the Fall of 1994 by all AAAA members with more than two consecutive years of membership.

Right: 1995 Hall of Fame Inductee and Air Cavalry pioneer, BG Charles E. Canedy, Ret., poses during his induction ceremony with his Hall of Fame escort, MG George W. Putnam, Jr., Ret.

Left: Mrs. Raymond A. Frank, wife of deceased Hall of Fame inductee CW4 Raymond A. Frank, 160th SOAR(A), poses beside her husband's portrait with her Hall of Fame escort, the Reverend Jerome R. Daly. CW4 Frank was killed in action in Somalia with Task Force Ranger.

Left: Mrs. Gary I. Gordon, wife of deceased Hall of Fame inductee MSG Gary I. Gordon, Task Force Ranger, USSOCOM, poses by her husband's portrait with her Hall of Fame escort, CW4 Michael J. Novosel, Ret. MSG Gordon received the Congressional Medal of Honor for his actions to protect wounded Night Stalkers in Somalia.

Left: Mr. Bartram A. Kelley, Hall of Fame inductee, poses beside his portrait with his Hall of Fame escort, Mr. Joseph P. Cribbins. Mr. Kelley, one of the pioneers in the helicopter industry, spent 35 years as an engineer with Bell Helicopter Textron.

Left: LTG Ellis D. Parker, Ret., Hall of Fame inductee, stands beside his portrait with his Hall of Fame escort, MG George S. Beatty, Jr., Ret. LTG Parker led the Aviation Branch for five and a half years and helped secure its place as a member of the Combined Arms Team.

Right: Mrs. Randall D. Shughart, wife of deceased Hall of Fame inductee SFC Randall D. Shughart, Task Force Ranger, USSOCOM, stands beside her husband's portrait with her Hall of Fame escort, COL John W. Marr, Ret. SFC Shughart received the Congressional Medal of Honor for actions to protect wounded Night Stalkers in Somalia.

Right: Mrs. Clifton P. Wolcott, wife of deceased Hall of Fame inductee CW4 Clifton P. Wolcott, 160th SOAR(A), stands beside her husband's portrait with her escort, COL Ted A. Crozier, Ret. CW4 Wolcott developed new techniques and tactics for the 160th, and was killed in action in Somalia.

Left: On Friday 31 March 1995, MG Ronald E. Adams, Aviation Branch Chief and Commanding General, USAAVNC and Ft. Rucker, AL, and 1995 AAAA Annual Convention Presentations Chairman, made the first Professional Session presentation.

Right: Following MG Adams, MG Dewitt T. Irby, Jr., Program Executive Officer, Aviation, delivered his update on acquisition and acquisition strategy.

Left: MG John S. Cowings, Commanding General, U.S. Army Aviation and Troop Command, St. Louis, MO, made his presentation on aviation logistics issues on Friday just before the Chief of Staff's Address.

Right: GEN Gordon R. Sullivan, Chief of Staff, U.S. Army, was Friday's Keynote Speaker. GEN Sullivan was presented with a Gold Order of St. Michael Award following his address and the AAAA Individual Awards. The Gold award has only been issued 17 times since the program began in 1990.

Right: GEN Sullivan (left) and BG Thomas W. Garrett, Commanding General, U.S. Army Safety Center (right), present CW5 Gerald D. Cartier, HQ, 10th Aviation Brigade, 10th Mountain Division (Light), Ft. Drum, NY with the McClellan Aviation Safety Award.

Left: GEN Sullivan and Mr. Joseph P. Cribbins (right) pose with Mr. Rodney J. Schulz (center), winner of the Joseph P. Cribbins Department of the Army Civilian of the Year Award.

Right: GEN Sullivan and CSM Marvin E. Horne (right), Command Sergeant Major, USAAVNC and Ft. Rucker, AL, present SSG Donald Wilson (center), 3-25th Aviation Regiment, Ft. Drum, NY with the Aviation Soldier of the Year Award.

Left: MG Harrison assists GEN Sullivan in presenting CW2 Victoria A. Welch (right), A Company, 2/158th Aviation Regiment, Ft. Carson, CO with the Army Aviator of the Year Award. CW2 Welch is the first female to win this award.

Left: Friday afternoon featured the Spouse Tea in honor of the AAAA National Awardees and Army Aviation Hall of Fame Spouses. Left to right are Mrs. Gordon, Mrs. Parker, Mrs. Frank, Mrs. Wolcott, Mrs. Shughart, Mrs. Schulz, Mrs. Cartier, Mrs. Wilson, Mrs. Johnson, Mrs. Moody, and Mrs. Kaufmann.

Left: Friday evening the traditional President's Reception was held prior to the beginning of the AAAA Chapter Receptions. A receiving line, plentiful hors d'oeuvres, and lots of camaraderie were the order of the day.

EXHIBITORS IN PRINT

Right: Saturday morning's First Light Breakfast featured an address by former Army Aviator, the Honorable Gilbert F. Decker, Assistant Secretary of the Army for RD&A. Following the breakfast, three simultaneous forums were conducted to take questions from the audiences and brief on their areas of responsibilities.

Right: Saturday's Operations and Training Forum, chaired by MG Ronald E. Adams, consisted of senior officers/directors from USAAVNC, TRADOC, STRICOM, and major Army operational units.

Left: The Acquisition Forum was chaired by MG Dewitt T. Irby, Jr., Program Executive Officer, Aviation and included the PMs of all major Army Aviation systems under the PEO umbrella.

Left: Mr. Daniel J. Rubery, Acting Deputy Commander, U.S. Army ATCOM, chaired the Logistics Forum. Panelists included the Directors/Chiefs of major Aviation logistics centers, offices, and activities.

Right: GEN Dennis J. Reimer, Commanding General, U.S. Army Forces Command and 1995 AAAA Annual Banquet Speaker poses with Virginia Military Institute cadets a few minutes prior to the start of the event. The following week, GEN Reimer was named to be nominated to succeed GEN Sullivan as the Chief of Staff, U.S. Army.

Left: Banquet entertainment was provided by "The High Priced Help", formerly "Three Majors and a Minor". Formed in 1966 in Vietnam, the band is believed to be the only Vietnam era group of its kind still together and making music. The members, all former Army Aviators and AAAA members, are Majors (Ret) Jack Westlake, Scat McNatt, Chinch Wollerton, and Marty Heuer. Songs included "Vietnam", "Black Sam", and "Peter Pilot".

Right: MG Harrison, outgoing AAAA President receives the AAAA "Cube" award from the incoming AAAA President, MG Richard E. Stephenson, Ret., for his service as President over the last two years. The next AAAA Annual Convention will be held in Ft. Worth, TX 27-30 March 1996. See you there!

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TARHEEL
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CW2 Randy T. Pegram

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(Continued from Page 57)

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Mr. James Randall Spotswood
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ROCHESTER, NY
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SILVER EAGLES

The SILVER EAGLES Program was established in 1988 to recognize those AAAA supporters who have been members for at least 30 years. Those 30 year members who joined AAAA in 1965 are:

Bailey, Hilliard C., Mr., Ret.
Ballard, Richard L., Mr., Ret.
Boyd, Clinton B., COL, Ret.
Brackett, Thomas R., LTC, Ret.
Brown, Howard E., COL, Ret.
Brown, Richard E., MWI, Ret.
Butler, Gary R., LTC, Ret.
Callous, Dennis A.Jr, CW3, Ret.
Canabalis, Julian T., LTC, Ret.
Cavanaugh, E. W., Mr.
Chaplin, Robt. D.III, LTC, Ret.
Clubb, Edwin R., MAJ, Ret.
Cooper, Nelson J., LTC, Ret.
Craig, William R., LTC, Ret.
Crask, Garnett E., LTC, Ret.
Dailey, Charles L., CWI, Ret.
Doty, Benjamin E., MG, Ret.
Duplessis, Troy L., Jr, CW5
Eddy, Gary D., CWI, Ret.
Erickson, Gerald R., Mr., Ret.
Fraser, Harry L., LTC, Ret.
Greene, Gerald R., LTC, Ret.
Gutsche, Walter W., CWI, Ret.
Holden, James O., COL
Kambrod, Matthew R., COL, Ret.
Kerr, John A., MAJ, Ret.
Leonard, John F. Jr., CWI, Ret.
Madieh, Daniel T., COL, Ret.
Martin, George E., LTC, Ret.
McKimmey, James R., COL, Ret.
McLemore, Melvin J., COL
Meissner, Kenith E., LTC, Ret.
Mills, James J., COL, Ret.
O'Neal, William F., COL
Ostovich, Rudolph III, MG, Ret.
Petit, Thomas W., CWI
Rebholz, Edward S., LTC, Ret.
Riddle, Ralph E. Jr., MAJ
Smith, Thomas G. Sr., LTC, Ret.
Stults, Theodore M., COL, Ret.
Tanner, Warren M., MAJ, Ret.
Tastad, Jerome W., LTC, Ret.
Thomas, Frank J., Mr., Ret.
Tulloch, John S., CWI, Ret.
Walsh, John A., CWI, Ret.
Watts, Olen C., COL, Ret.
Wilson, Grady W., LTC, Ret.
Youngpeter, Donald E., LTC, Ret.

HUNTER
(Continued from Page 21)

second system is already on the ground in the Sierra Vista area, and I anticipate an easier time in getting the DD-250 signed on the remaining systems. The product we have delivered will enable our Army, Navy, and Marine Corps combat units to collect and disseminate information on potential enemy territory and targets without subjecting our personnel to harm.

The Hunter will give us coverage out to a distance of about 125 miles beyond the Forward Line of Own Troops (FLOT). We expect it to be airborne for eight hours, and to have the ability to stretch its operating radius by relaying imagery through a second airborne Hunter.

Altogether, Hunter will be the most capable UAV in the world, in the tactical arena — the baseline of the Department of Defense's unmanned aerial reconnaissance force.

As I said in the July 1994 issue of this magazine, I hope never again to see the face of a brave Army aviator decorating the front pages of newspapers after being shot down and captured on an intelligence mission. With Hunter, and the grace of God, I believe I have a reasonable chance of seeing that hope become reality.

★★

COL Tanguay is the PM, Joint Tactical Unmanned Aerial Vehicles, Huntsville, AL.

NEW NEB INSTALLED

During the recent Annual Convention in Atlanta, GA, the new members of the National Executive Board were installed. The officers are **MG Richard E. Stephenson, Ret.** (President); **MG John D. Robinson, Ret.** (Senior VP and Chairman, Membership Committee); **MG Carl H. McNair, Jr., Ret.** (Secretary-Treasurer); and **Terrence M. Coakley** (Executive Director).

Vice Presidents include: **COL Sylvester C. Berdux, Ret.; MG Robert S. Frix; CW5 Ronald W. Gerner; LTG Jack V. Mackmull, Ret.; MG Rudolph Ostovich III, Ret.; James P. Schwalbe**; and **George T. Singley III**.

MG Stephenson appointed the following as National Members-at-Large: **COL Dave Carothers, Ret.; MG John S. Cowings; LTC(P) Stephen T. Cox; SGM Jeffrey R. Culp; CPT Robert L. Douthit; LTG William R. Forster; BG Jerome V. Foust; BG Stewart W. Gerald; Thomas L. House; CSM Marvin E. Horne; COL Gerald R. Kunde, Ret.; MAJ Jeanette M. McMahon; LTG Ellis D. Parker, Ret.; William Pollard; CW5 Darrell C. Pope; BG(P) John M. Riggs; GEN Crosbie E. Saint, Ret.; BG James R. Snider**; and **COL Harry W. Townsend, Ret.**. Additionally, **Mr. Joseph P. Cribbins** and **COL John J. Stanko, Ret.** serve as National Members-at-Large Emeritus.

AAAA Past Presidents, who serve in perpetuity, include: **GEN Hamilton H. Howze, Ret.; LTG Harry W. O. Kinnard, Ret.; MG Delk M. Oden, Ret.; LTG John M. Wright, Jr., Ret.; LTG Robert R. Williams, Ret.; MG George S. Beatty, Jr., Ret.; COL John W. Marr, Ret.; MG James C. Smith, Ret.; MG George W. Putnam, Jr., Ret.; MG Story C. Stevens, Ret.; BG James M. Hesson, Ret.; MG Charles F. Drenz, Ret.**; and **MG Benjamin L. Harrison, Ret.**. The Past Executive Vice President, **Arthur H. Kesten**, also serves in perpetuity on the NEB. USAREUR Region President is **COL Stephen K. Cook**.

The Presidents of Chapters with more than 150 members fill the remaining seats on the 73 member board.

SCHOLARSHIP BOARD ANNOUNCED

The AAAA Scholarship Foundation Board of Governors also met during the AAAA Annual Convention in Atlanta, GA. The current officers are: **COL John W. Marr, Ret.** (President); **Mrs. Dorothy Kesten** (Vice President); **COL Robert L. Parnell, Jr., USMC, Ret.** (Secretary); **COL Gerald E. Lethcoe, Jr., Ret.** (Treasurer); and **Terrence M. Coakley** (Executive Director).

Governors include: **Dan R. Bannister; CW4 Sandra L. Beebe; LTC Frank S. Besson III, Ret.; LTC Robert P. Birmingham; Mr. Edward L. Carnes; COL Dave Carothers, Ret.; Ms. Carolyn Chapman; MAJ Brian M. Craddock; CSM Raywood P. Dartez; LTC Jan S. Drabczuk; MG Robert S. Frix; BG Stuart W. Gerald; Jose J. Guzman; Paul L. Hendrickson; BG James M. Hesson, Ret.; Leonard D. Kulik; Ronald V. Kurowsky; COL John A. Lasch III, Ret.; COL William F. O'Neal, Ret.; LTC Lawrence P. Peduzzi, Ret.; CW4 Joseph L. Pisano, Ret.; William Pollard; LTC Frank H. Radspinner, Ret.; LTC Ralph W. Shaw, Ret.; COL Harry W. Townsend, Ret.**; and **LTC James O. Woodward, Ret.**

President Emeritus who serve in perpetuity incude: **MG John L. Klingenhagen, Ret.; COL Rudolph D. Descouteau, Ret.; MG George W. Putnam, Jr., Ret.**; and **MG Richard E. Stephenson, Ret.**

The AAAA President's Annual Report

The following remarks are excerpted from the AAAA President's Annual Report delivered by the President, MG Benjamin L. Harrison, Ret., during the AAAA Membership Meeting, 30 March 1995, at the AAAA Annual Convention in Atlanta, GA.

In total membership, as of March 1, 1995 there were 16,028 active members, almost identical to last year's number. Notably, enlisted membership has grown another 4% over 1994. Enlisted membership is now almost 18% of total AAAA membership. Life memberships have also grown to crack the 1,000 level at 1,019 and industry support remains strong with 194 Industry Members. Sustaining Memberships for local non defense related businesses are still popular with our chapters with 48 as of March 1st.

National, Regional, and Chapter activities have done very well over the last year. The Twelfth Annual Quad-A Aviation Electronic Combat (AEC) Symposium took place in early November and drew a record crowd in Charlotte, NC.

Two months ago, the Lindbergh Chapter Annual Joseph P. Cribbins Product Support Symposium served as another excellent opportunity for AAAA to foster communication between the Army and Industry. The Lindbergh Chapter, once again, under the leadership of MG Dewitt T. Irby, Jr., hosted an outstanding event.

AAAA's 60 Chapters held more than 150 meetings in 1994. We have also welcomed one new AAAA Chapter in the last 12 months: the **Bavarian Chapter**, Hohenfels, Germany; and one re-activation — the **Old Tucson Chapter**, Marana, AZ.

ARMY AVIATION Magazine continues to bring comprehensive information written by and for the Army Aviation community to our members and also sponsors the Annual AAAA Essay Contest.

The top three essays are published in the magazine and first prize is $500, so fire up your word processors and send in your entry. Suspense is July 1.

One of AAAA's biggest annual efforts is the AAAA Awards Program. The AAAA recognizes excellence throughout the year. In November two awards were presented at the AAAA's Aviation Electronic Combat Symposium in Charlotte. The AAAA's Aircraft Survivability Equipment Award went to **CW2 Michael E. Croslin**, Aviation Brigade EWO, 1/227th Aviation Regiment, 1st Cavalry Division, Fort Hood, TX.

The Avionics Award was awarded to **CW4 Tommy Lee Dorris**, Avionics Platoon Leader, F Company, 1/160th Special Operation Aviation Regiment (Airborne), Ft. Campbell, KY.

At the AAAA Aviation Center Chapter Awards Dinner in Fort Rucker in January, this year's Army Aviation Trainer of the Year Award, sponsored by Hughes Training, Inc., Link Division, formerly CAE-Link, was awarded to **MSG Charles Neil Reisinger**, Eastern Army Aviation Training Site (EAATS), Annville, PA.

Also presented was the Army Aviation Air/Sea Rescue Award sponsored by Lucas Aerospace to **CW4 John P. Airington, CW4 David Schweitzer, SPC Frank G. Myers, and SPC Jared L. Cheramie**, 872d Medical Company, Lafayette, LA.

In addition, two of AAAA's newest awards, the Fixed Wing Unit Award and the Army Aviation Medicine Award sponsored by FlightSafety International and Gentex Corporation respectively, were also presented at the Aviation Center event.

The 1994 Fixed Wing Unit of the Year was the **3d Military Intelligence Battalion (Aerial Exploitation)**, Camp Humphreys, Korea.

The 1994 Army Aviation Medicine Award was won by **Major Lisa A. Black, D.O.**, 159th Combat Aviation Group (Airborne),

Fort Bragg, NC.

The AAAA Lindbergh Chapter Product Support Symposium in February 1995 was the venue for the presenting of the 1994 Logistics and Materiel Readiness Awards.

The Outstanding Logistic Support Unit of the Year Award for 1994 was awarded to **9/227th Aviation Support Battalion**, 1st Armored Division Support Command, Hanau, Germany.

The Individual Industry Award went to **Mr. Perry M. Smith**, CAS Incorporated, Huntsville, AL.

The Materiel Readiness Award for Contributions by an Industry Team, Group or Special Unit was awarded to the **DynCorp Contract Field Teams**, Germany.

The Small Business Organization Award went to **ERA Aviation Services**.

The Major Contractor Award was presented to **Bell Helicopter Textron, Inc.**

In addition to these various national and functional awards, there is the AAAA Distinguished Graduate Award program. This program was vastly expanded in 1992 and now provides the top graduates from the U.S. Army Aviation Logistics School and U.S. Army Aviation Center with awards documenting their achievements.

The Association also honors other outstanding young people who are entering Army Aviation with the AAAA Top ROTC Cadet of the Year and AAAA Top U.S. Military Academy Cadet of the Year Awards. The Top USMA Cadet for 1994 was **Spencer T. Kympton** and the Top ROTC Cadet was **Christopher C. Frost**.

Our most significant program, certainly in financial terms, is the AAAA Scholarship Foundation Inc. We help our members before, during, and after they and their loved ones graduate from college, through our support of the AAAA Scholarship Foundation, Inc. The Foundation was able to give out 63 scholarship grants and loans for a total of $141,500 in 1994 and is expected to exceed that effort in 1995.

Over the last few years, we have specifically earmarked scholarships for specific membership categories like Enlisted personnel that help insure fair distribution of this benefit. However, we still need many more applicants in our Enlisted, Warrant Officer and Company Grade ranks to make this program as effective as possible.

Your Association is managed by the National Executive Board consisting of ten elected Vice Presidents, twenty National Members-at-Large who are appointed annually by the President, and the Past Presidents of the AAAA, the Past Executive Vice President and National Members-at-Large Emeritus who serve as permanent members of the Board. In addition, the NEB is also comprised of the USAREUR Region President and the Presidents of Chapters representing 150 or more members.

In recent years, we have expanded the NEB to include additional company grade officers, warrant officers and enlisted soldiers as National Members-at Large.

This breadth and depth of experience of personnel serving on the NEB is intended to keep your leadership in touch with the real world of our membership. You should not hesitate to communicate your thoughts to your board representative.

With all these programs, how do we keep financially solvent? Membership dues alone do NOT cover our expenses. The answer is the support of our Industry members. As I mentioned earlier, much of our income comes directly from this Annual Convention with the sale of exhibit space to our industry member firms. We deeply appreciate all they do for us year in and year out.

These are certainly challenging times, but with our solid membership numbers and strong industry support, we look forward to the next year and the future of an even stronger and more vital Army Aviation Association of America. ■

New AAAA Chapter Officers

Aloha:
MAJ Michael J. Kerzie (Treas); CSM Robert F. Eckrich, Jr. (VP, Enlisted Affairs).

Colonial Virginia:
LTC Mark S. Jones (VP, ROTC Affairs).

Corpus Christi:
CW5 Jodie R. Glover (SrVP); Stella R. Nilles (Treas); Frank A. Sijansky (VP, Benefits); SSG W. Kent Anger (VP, Mil. Affs); Virginia R. Hatley (Historian).

Giebelstadt:
MAJ Lowell C. Preskitt (Treas); MAJ James C. Miller (VP, Prog).

Savannah:
CPT Bruce E. Fifer (Treasurer).

New AAAA Industry Members

Danaher Tool Group
Springfield, VA

Lear Astronics Corp.
Arlington, VA

Mentorplus Software Inc.
Aurora, OR

Qualicorp/DDP
Chicago, IL

Sears Roebuck & Co., Sears Ind. Sales
Hoffman Estates, IL

Surviac
Wright-Patterson Air Force Base, OH

Varo Inc., Electronic Systems Division
Garland, TX

AAAA BALANCE SHEET AS OF DECEMBER 31, 1994

ASSETS	
Cash	$91,805
Cash Equivalents	140,075
Securities Available-for-Sale	425,318
Accounts Receivable	327
Inventory of Pins	15,909
Prepaid Administrative Fees	213,875
TOTAL ASSETS	$887,309
LIABILITIES	
Accrued Expenses and Allocations Payable	$30,777
Deferred Membership Dues	208,117
Deferred Convention Revenues	264,910
TOTAL LIABILITIES	$503,804
FUND BALANCES	
General Fund	$85,149
Board Designated Funds	
Emergency Fund	270,883
Net of Unrealized Holding Loss on Available-for-Sale Securities	
Hall of Fame Escrow Fund	14,296
Order of St. Michael Fund	13,177
TOTAL FUND BALANCES	383,505
TOTAL LIABILITIES AND FUND BALANCES	$887,309

STATEMENT OF REVENUE, EXPENSES AND CHANGES IN FUND BALANCES FOR THE YEAR ENDED DECEMBER 31, 1994

REVENUES	
Membership Dues	$314,830
Annual Convention	781,107
AEC Symposium	39,055
Souvenirs	1,392
Interest	28,358
Realized Loss on Sale of Available-for-Sale Securities	(12,064)
Miscellaneous	7,488
TOTAL REVENUES	$1,160,166
EXPENSES	
General and Administrative	$498,298
Annual Convention	502,977
AEC Symposium	26,690
AAAA Scholarship Foundation	31,141
Special Allocations	56,271
TOTAL EXPENSES	$1,115,377
EXCESS OF REVENUES OVER EXPENSES	44,789
FUND BALANCE — BEGINNING	349,729
Adjustment of Unrealized Holding Losses	(11,013)
FUND BALANCE — ENDING	$383,505

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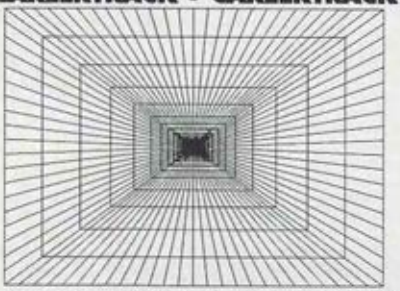

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Active AAAA members may have a 30-word classified employment ad published in two consecutive issues of **ARMY AVIATION** free of charge.

If you'd like to take advantage of the AAAA CareerTrack employment referral service, but you're not yet a member of AAAA, the solution is simple. Request an AAAA membership application with your CareerTrack application.

For further information, contact:

AAAA, 49 Richmondville Avenue, Westport, CT 06880; Telephone: (203) 226-8184; FAX: (203) 222-9863.

Five years experience in manufacturing operations and marketing. Inventory control, safety, training, and personnel management. Airport commission member and municipal experience. B.S., MBA Marketing. Will relocate.

95-05-01

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.

A A A A NEWS

July 1995

✔ **Jul. 14.** AAAA Scholarship Board of Governors Executive Committee Meeting, Best Western, Arlington, VA.

✔ **Jul. 15.** AAAA National Scholarship Selection Committee Meeting to select 1995 scholarship recipients, Best Western, Arlington, VA.

October 1995

✔ **Oct. 16.** AAAA National Executive Board Meeting, Sheraton Washington Hotel, Washington, D.C.

✔ **Oct. 16.** AAAA Scholarship Board of Governors Executive Committee Meeting, Sheraton Washington Hotel, Washington, D.C.

January 1996

✔ **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.

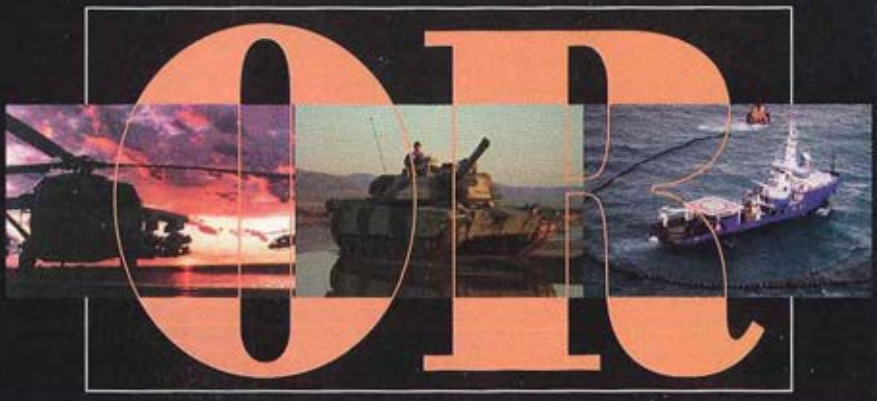
March 1996

✔ **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.

OPERATIONAL READINESS



It's the measure of our success.

At Fort Irwin, CA, providing 425,000 operationally ready vehicle miles per month.

At Camp Doha, Kuwait, supplying 337,500 combat-ready vehicle miles weekly.

At Fort Rucker, AL, delivering 3,600 training-ready system hours per day.

And along the U.S. coastline, the Virgin Islands and Hawaii, responding to oil spills exceeding 50,400 gallons within two hours.

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