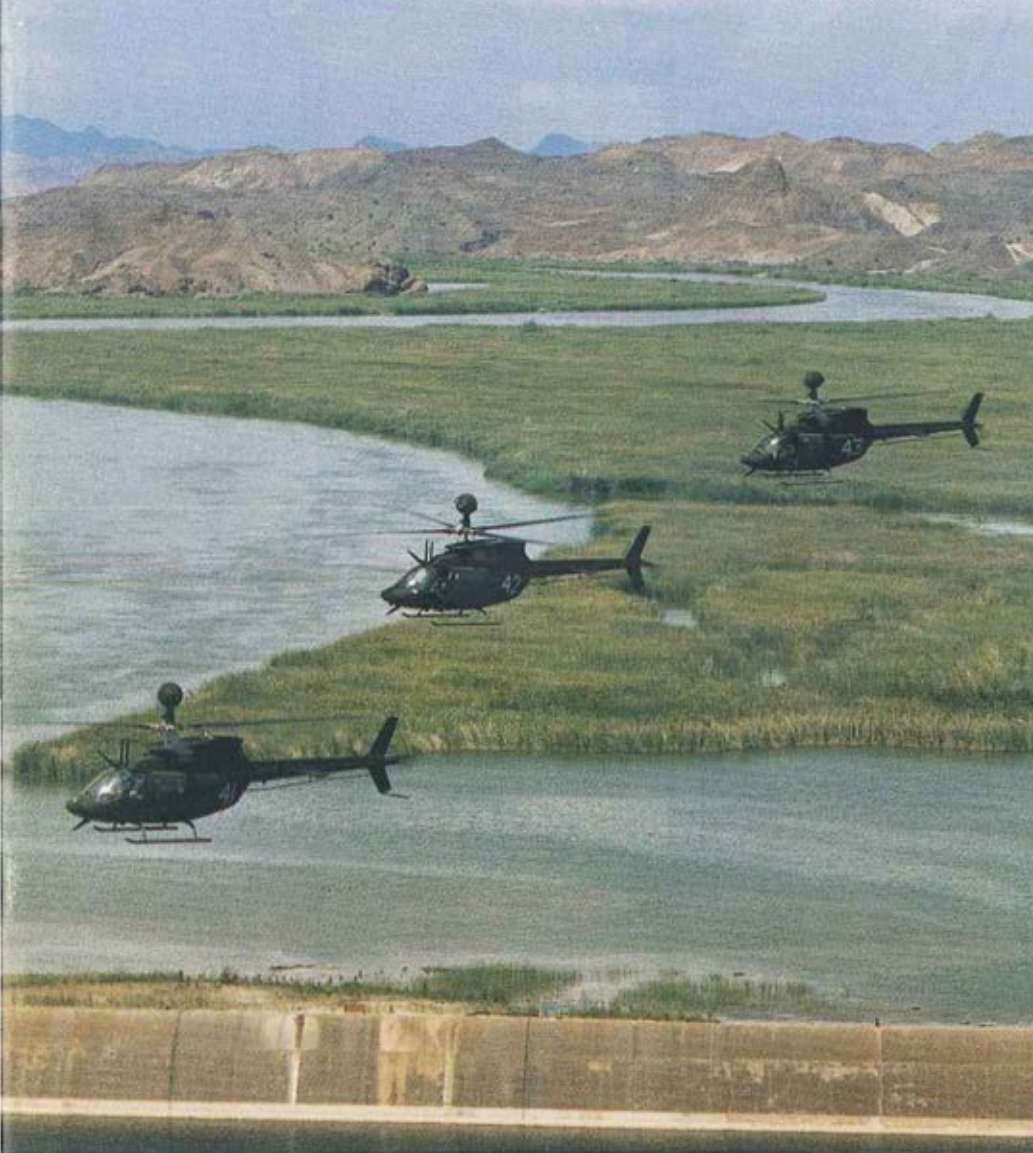
SPECIAL ISSUE: U.S. ARMY AVSCOM — 1985

1985 AAAA NATIONAL CONVENTION DETAILS

Army Aviation

JANUARY 31, 1985



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Army Aviation

January 31, 1985

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OTHER FEATURES

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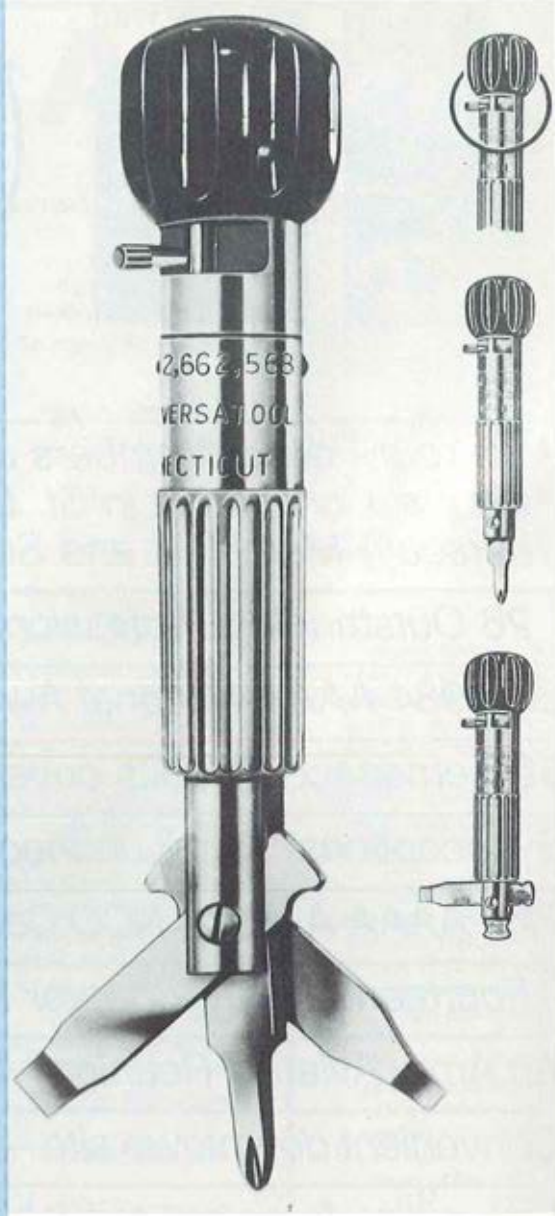

1985 AAAA National Convention
Advance Registration Form—Hotel Registration Form

SHERATON ST. LOUIS HOTEL AND CERVANTES CONVENTION CENTER, ST. LOUIS, MO. — MARCH 28-31, 1985

I plan to attend the 1985 AAAA NATIONAL CONVENTION. I understand that I must return this form by **MONDAY, FEBRUARY 25, 1985,** and that I may receive a full refund of my function fees by phone call to AAAA made on or before **WEDNESDAY, MARCH 20, 1985,** or by written notification to AAAA that is received not later than **MARCH 20. Please print or type** all information. **NOTE:** Military fees and room rates apply only to Active Army and DAC personnel and to those Reserve Component and retired AAAA members who are not in the current employ of defense contractors or suppliers on a full-time, part-time, or consulting basis.

FULL NAME, INCLUDING RANK _____

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CITY _____ STATE _____ ZIP _____

NICKNAME FOR BADGE _____ SPOUSE'S NAME, IF ATTENDING _____

UNIT OR FIRM NAME FOR BADGE _____ OFF. PHONE ( ) _____

UNIT OR FIRM CITY AND STATE FOR BADGE _____

ARE YOU A MEMBER OF YOUR FIRM'S EXHIBIT HALL STAFF? ☐ YES; ☐ NO

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

1985 AAAA Convention Registration Form

SPECIFIC FUNCTION HELD AT THE 1985 NATIONAL CONVENTION OF AAAA	MIL/DAC MEMB. OR SPOUSE*	CIVILIAN MEMB. OR SPOUSE*	ITEM LINE TOTAL	OFFICE USE
REGISTRATION (Needed to attend Professional Sessions.)	☐ $10	☐ $55	$ _____	_____
SPOUSE'S BREAKFAST, Sheraton St. Louis, Friday, March 29	☐ $7	☐ $7	$ _____	4 _____
MEMBERSHIP LUNCHEON, Sheraton St. Louis, Friday, March 29	☐ $7	☐ $14	$ _____	5 _____
PRESIDENT'S RECEPTION, Sheraton St. Louis, Friday March 29	☐ $8	☐ $16	$ _____	6 _____
SPOUSES' CITY HIGHLIGHTS & GATEWAY ARCH TOUR, Sat. March 30	☐ $13	☐ $13	$ _____	8 _____
EXHIBIT HALL LUNCHEON, Convention Center, Saturday, March 30	☐ $6	☐ $12	$ _____	9 _____
● RECEPTION & AWARDS BANQUET, Convention Center, Sat., Mar.30	☐ $25	☐ $50	$ _____	10 _____
CHAMPAGNE BRUNCH, Sheraton St. Louis, Sunday, March 31	☐ $6	☐ $12	$ _____	12 _____
★ MEMBERSHIP FEE FOR NON-MEMBERS	☐ $15	☐ $15	$ _____	_____

■ TOTAL Circle: Mastercard Visa Personal Check Business Check $ _____ M V P B

CREDIT CARD NUMBER _____ EXPIRATION DATE _____

SIGNATURE _____

★ AAAA membership is required to attend the Convention. ● Formal/Black Tie, Dark Business Suit; Military Blues/Mess Jacket. *Spouses are not required to register. ■ Mastercard & Visa credit cards only; no others accepted for function fees.

Please complete and return this form with the appropriate Convention Fee or Fees and your hotel deposit, if applicable, to: AAAA, 1 Crestwood Road, Westport, CT 06880 by Monday, FEBRUARY 25, 1985.

Hotel Reservation Form

1985 AAAA NATIONAL CONVENTION—ST. LOUIS, MO—MARCH 28-31, 1985
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CHECK THE HOTEL YOU PREFER:

( ) SHERATON ST. LOUIS (AAAA HQ HOTEL) ( ) RADISSON ST. LOUIS (½-BLOCK FROM SHERATON)

ARRIVAL DATE _____; ARRIVAL TIME _____; NO. NIGHTS _____; DEPARTURE DATE _____

PLEASE CHECK THE ROOM RATE DESIRED:

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SHARING ROOM WITH _____

GUARANTEED? ☐; CHECK BOX: ☐ Mastercard; ☐ Visa; ☐ American Express; ☐ Personal Check; ☐ Business Check

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I understand that to receive a room at AAAA convention rates, I must register or attend at least one of the functions of the 1985 AAAA NATIONAL CONVENTION and that I must return this form to AAAA by **MONDAY, FEBRUARY 25, 1985.** Reservations that are received after **FEBRUARY 25, 1985** will be accepted on a space-available basis. Military identification may be requested by the hotel to receive a room at a military rate.

NOTE: All requests for hotel suites, other than AAAA Chapter Hospitality Suites, must be directed to Lynn Coakley, AAAA National Office, (203) 226-8184.

Reservations will be held until 4:00 p.m. unless guaranteed or covered by deposit equal to one night's stay. Guaranteed hotel reservations must be cancelled before 6 p.m. destination time on the day of arrival. Non-guaranteed reservations will be held until 4 p.m. destination time on the day of arrival, then released for sale to the general public. Cancellation of hotel reservations may be directed to AAAA by phone up to **WEDNESDAY, MARCH 20, 1985.**

Room charges are subject to applicable local and city taxes. Check-in time is 3:00 p.m. Check-out time is 1:00 p.m. If a room at the hotel you prefer is not available, one at the nearest rate will be reserved at a nearby AAAA-designated hotel.

Please complete and return this form with the appropriate Convention Fee or Fees and your hotel deposit, if applicable, to: AAAA, 1 Crestwood Road, Westport, CT 06880 by Monday, FEBRUARY 25, 1985.

The ARMY AVIATION ASSOCIATION is pleased to announce its 1984 AAAA NATIONAL AWARD WINNERS

THE "OUTSTANDING AVIATION UNIT OF THE YEAR AWARD"
210th Combat Aviation Battalion
Fort Kobbe, Panama
Lieutenant Colonel Theodore A. Duck, Commander

THE "ARMY AVIATOR OF THE YEAR AWARD"
Colonel Robert L. Stewart
NASA Astronaut Program, Lyndon B. Johnson Space Center
Houston, Texas

THE "AVIATION SOLDIER OF THE YEAR AWARD"
Staff Sergeant Ronnie Garrett
11th Combat Aviation Squadron, 11th Armored Cavalry Regiment
APO New York 09146

THE "DEPARTMENT OF THE ARMY CIVILIAN OF THE YEAR AWARD"
Mr. Robert A. Robbins
U.S. Army Aviation Engineering Flight Activity
Edwards AFB, California

THE "ROBERT M. LEICH SPECIAL AWARD"
The U.S. Army Safety Center
Fort Rucker, Alabama
Colonel Terence M. Henry, Commander

THE "JAMES H. McCLELLAN AVIATION SAFETY AWARD"
Chief Warrant Officer (W4) Ralph V. Tolbert
6th Cavalry Brigade (Air Combat)
Fort Hood, Texas

THE "OUTSTANDING RESERVE COMPONENT AVIATION UNIT AWARD"
40th Combat Aviation Battalion
California Army National Guard
Lt. Colonel James C. Ghormley, III, Commander

ALLISON AND GARRETT. THE LHX TEAM

A wealth of small engine technology has been funded by both the Army and the Air Force in recent years. With the production of LHX, two of America's most respected turbine engine manufacturers stand ready to turn those investment dollars into reliable horsepower for the Army. Paying back knowledge gained from success in current military engine programs.

Together, Allison and Garrett propose to develop the low-risk Advanced Technology Engine ATE109 for LHX, then compete for its production.

Garrett, with experience gained from over 50,000 aircraft and ground turbine engines, is developing the Advanced F109 Air Force Trainer Engine. The first engine planned for inventory to meet the strict Engine Structural Integrity Program (ENSIP). It demonstrates the power section technology that will be used in the ATE109. This ensures the Army of an LHX engine that offers advanced durability and high performance. At the lowest possible risk.

Allison's production base incorporates over 20,000 helicopter engines delivered, including 5,000 engines in the U.S. Army inventory alone. They have just completed a program on the Advanced Technology Demonstrator Engine (ATDE). This engine has exceeded all the Army's performance goals for advanced helicopter

THAT ALREADY HAS THE RIGHT STUFF.

engines. This technology will be fully implemented in the new ATE109.

New production techniques can be implemented quickly, too. Garrett production facilities utilize some of the latest manufacturing and testing techniques known. And Allison, with its "factory of the future" program, has the capability to meet any production needs. Several times during this century Allison has turned out impressive numbers of engines, when America needed engines.

Both companies have spent years perfecting the art of building small, powerful turbine engines at low cost. And on schedule.

In fact, both Garrett and Allison have a reputation for producing highly-reliable, low-cost turbine engines in the extremely competitive commercial market.

We are pleased to work as a team, because together we will advance gas turbine technology beyond our individual accomplishments. And build a superior LHX engine.

We bring a diversity of talented personnel, working with experienced suppliers and vendors. Resources which cannot be manufactured. What's more, our combined extensive facilities are geographically dispersed throughout major portions of the country. Providing the added benefit of increased job opportunities across the United States.

Allison and Garrett.

America's LHX team.

Army Aviation Association

1 CRESTWOOD ROAD, WESTPORT, CT 06880
(203) 226-8184

I'm one of several senior Aviation Warrant Officers who serve on AAAA's National Executive Board. In my case, I hold a three-year elective office — that of Vice President. In my duty assignment I serve in the Warrant Officer Division of MILPERCEN having been preceded on the AAAA Board by several Warrant Officer Division CW4s known to many: "Mel" Cook, Lloyd Washer, and Lee Kornich . . We've been joined on the AAAA's Board at other times by many other CW4s from the field, a few of the more illustrious being Bob Hamilton, Don Joyce, and Mike Novosel. We are truly a hard working part of this Association.

Each of us - during our time of AAAA service - has been expected to speak for and to represent the Aviation Warrant Officer members of the Ass'n at the National level, and I feel that we've all done so. You might be interested to know that AWOs — from WOCs undergoing training to the most senior CW4s — now represent almost 25% of the AAAA's military membership. For the record, the current AWO total of 2,404 members exceeds the company grade, enlisted, and DAC membership segments and is only exceeded in number by the 3,004 field grade members of Quad-A. We are truly a sizable part of this Association.

The "Who's Who in AWO Aviation" directory that appears as a centerfold pull-out in each November issue of "Army Aviation" lists the professional and personal data of more than a thousand AWOs, and is a most useful compendium. It substantiates the high degree of professionalism that Army Aviation has come to expect from its Aviation Warrants. By just skimming through this directory one can quickly see the varied career patterns that are open to our AWO members. This issue — and the annual "Convention Issue" of the magazine — also confirm that AWOs serve on many, many Chapter Executive Boards in all offices — and with regard to AAAA's annual National Awards and the AAAA-sponsored Hall of Fame at the Army Aviation Museum, our CWO and WO members have been singled out repeatedly for individual honors. We are truly an important part of this Association.

Hardworking, sizable, important. That's the part we AWOs play in AAAA.

David E. Helton
CW4
Vice President, AAAA

MG "Don" Parker assumes role as Aviation's new Branch Chief

WITH a backdrop of Army aircraft and two brigades of soldiers, the architect of the Army's Aviation Branch turned his command over to a new branch chief at Ft. Rucker on Jan. 17.

Major General Bobby J. Maddox, who headed the establishment of the newest Army branch, turned the Aviation Center colors over to newly promoted **MG Ellis D. Parker.** The event was presided over by **GEN William R. Richardson,** commanding general of the **Army Training and Doctrine Command (TRADOC),** Fort Monroe, VA.

Richardson praised Maddox as being a great commandant at the Aviation Center and School, as he presented him the Distinguished Service Medal. He said, "**Bo Maddox** brought aviation to the point where it is a complete member of the combined arms team."

He also praised **Maddox's** effort in improving the quality of life on the post by saying, "You have carved out programs which will improve the quality of life in the years ahead and you can be pleased by your accomplishments."

Richardson expressed confidence that Parker will be an equally great commandant.

"**Parker** is a great trainer and combat leader. The Army could not have selected a better person to follow in the footsteps of **Bo Maddox.** His great obligation is to see that aviation performs, in every aspect, as a member of the team," **Richardson** said.

In accepting command, **Parker** said he will give 110% effort to continue building Army Aviation to new heights, with the help of the whole Wiregrass Area team.

"I've traveled around the Army for 30 years and been in many communities. If I have ever found a finer community, in terms of spirit, cooperation, and support for the efforts of a military installation, than in the Wiregrass, I don't know where or when," **Parker** said.

Troops from Fort Rucker's two brigades participated in the ceremony, led by their commanders: **COL Haspard R. Murphy,** Aviation Training Brigade; and **COL Lynn C. Hooper,** 1st Aviation Brigade (Air Assault).

Among the aircraft on display was the AH-64 APACHE, the first of the new attack helicopters to be sent to the Aviation Center. It arrived at Rucker Wednesday (Jan. 16) and will undergo testing at the Army Aviation Development Test Activity. ||||

—Al Endicott

FORT RUCKER'S NEW COMMANDING GENERAL, MG ELLIS D. PARKER, CENTER, ACCEPTS THE COLORS FOR THE AVIATION CENTER. MAKING THE PRESENTATION IS GEN. WILLIAM R. RICHARDSON, LEFT, COMMANDING GENERAL OF THE ARMY TRAINING AND DOCTRINE COMMAND. LOOKING ON IS OUTGOING RUCKER COMMANDER, MG BOBBY J. MADDOX.

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As AAAA's Official Airline, TWA offers AAAA members a special fare between their points of origin and the St. Louis convention site

The **Convention Fare** will be the applicable 7 Day Super Saver waiving the minimum stay requirements. This **Convention Fare** will apply on all TWA direct and connecting flights. Reservations must be made and tickets purchased at least 7 days prior to scheduled departure. Lower special fares may also be available provided you purchase your ticket at least 30 days prior to departure. Be sure to ask the TWA agent for the details of these special plans.

The applicable **dates of travel** for the above special **AAAA Convention Fare** will be as follows:
Airfare not valid before March 23, 1985.
Airfare not valid after April 3, 1985.

All reservations using this fare will be booked in the "B" class allocation of the TWA flight involved.

TWA's group travel specialists will assist AAAA members by the maintenance of a **toll free telephone number** throughout the U.S. to be used between 8 A.M. and 5 P.M. (CST), Monday through Friday, to contact TWA's reservations experts to schedule and confirm TWA and other airline itineraries from their originating cities.

The toll free number is **(800-325-4933).** In Missouri, (800-392-1673). In St. Louis (291-5589.

The AAAA National Convention has been assigned a Convention Profile Number by TWA: **99-10933.** This number should be referenced by members when calling TWA's Convention Desk.

SPECIAL REPORT

U.S. ARMY

AVIATION SYSTEMS COMMAND

THE NEW AVIATION SYSTEMS COMMAND

BY GENERAL RICHARD H. THOMPSON
Commanding General, U.S. Army Materiel Command

I am pleased to be a part of this issue dedicated to the U.S. Army Aviation Systems Command.

AVSCOM is an important element of the **U.S. Army Materiel Command (AMC),** which is in the business of providing the total Army with quality equipment and support, now and for the future. Among our major missions are the research, development, acquisition and fielding of the Army's materiel, plus the maintenance and modernization of materiel already fielded. This, of course, includes aviation and aviation equipment.

The Aviation Systems Command was organized to strengthen and satisfy the Army's need for better management of aviation materiel in support of our forces around the world. To do this, AVSCOM assumed the aviation-related missions of the former Aviation Research and Development Command and the Troop Support and Aviation Materiel Readiness Command.

We must never again allow either readiness or research and development to take a back seat, one to the other. We cannot overlook the absolute necessity of a readiness posture because we are dazzled by the excitement of new developments.

Our challenge is to provide quality equipment and support for an excellent Army and, in so doing, to ensure our aviation systems can endure a harsh environment on the battlefield of the future. The U.S. Army Aviation Systems Command is working to that end.

AVSCOM: A VIEW FROM THE TOP

BY MAJOR GENERAL ORLANDO E. GONZALES

AVIATION is a highly visible and sophisticated part of a complex and professional Army safeguarding the nation. The bottom line for those of use who serve in the U.S. Army Aviation Systems Command is to provide our soldiers with the very best equipment available, and with the very best support we can. To put our present AVSCOM program into proper context, it's necessary to briefly review the past.

We've come a long way

Throughout much of this century, the Army, in spite of being the country's senior military service, has fared the poorest in terms of the budget available for modernization. Since the end of World War II, the national priority has been the upgrading of strategic defense resources; and that is as it should have been.

The consequence of this policy, though, has been a reduced allocation for the development of land forces. Our Army had to fight in Korea with WWII leftovers. Our posture improved somewhat during the late 1950's, but when Vietnam came along, we still had not been able to reap the full benefit from the technology available.

Yet we of the Army can be proud of the distance we've come along a road that hasn't always been smooth. Many changes have taken place, both in our force structure and our inventory, most notably in the past few years. It's an exciting time to be involved in the business of flying, and of supporting those in Army Aviation.

We of the U.S. Army's aviation family today have particular reason to be proud. Army Aviation is an important element of deterrence. Control and use of the air just a few feet above the battlefield has become simply an extension of our more traditional arena of activity.

Today, the U.S. Army operates a fleet of nearly 9,000 helicopters. This makes us the largest operator of such aircraft anyplace in the world. We of the U.S. Army Aviation Systems Command are very much at the heart of this effort. From our headquarters here in St. Louis, and from our labs and operating facilities across the country and around the world, we of AVSCOM are totally engrossed in keeping the fleet modernized, credible, and ready. It's a big job, involving research and development; rotary and fixed wing procurement; spare parts acquisition; inventory control; maintenance program planning; and many other activities.

A very big year

Fiscal Year 1984 was a big year for us, primarily because of our reorganization back into a command involved with all aspects of Army Aviation.

Everyone at AVSCOM really turned to during the year to make the reorganization a smooth and effective effort. I'm extremely proud of the workforce, and what they did. Their performance was really phenomenal. Everyplace that I go within the command, I see a lot of first-rate and extremely professional work being done. We're not only a good team, we are a big team and we work with a lot of money. During FY '84, our comptroller reports that AVSCOM managed a $4.9 billion program. That puts us into the position of being favorably compared to many of the largest private corporations doing business in America today.

Our FY '84 program was quite well executed, in spite of all the turmoil of bringing together

research and development, acquisition, and materiel management into a single readiness package.

The first three months of the year were spent in a provisional status, and the second quarter was spent getting our activities reorganized and relocated into an AVSCOM mode. It really wasn't until the first of March that we were able to focus full-time on our primary job.

Even so, I'm pleased to tell you that all our programs are on track and doing well. During FY '84, we put a lot of effort into support of the AH-64 APACHE program. Likewise, significant gains were made in the LHX program which will produce the craft so vital to air operations at the turn of the century. Work being done to upgrade the COBRA and the CH-47D and the advanced scout helicopter is progressing smoothly, and the remotely-piloted vehicle program is also doing well, considering the high degree of complexity in this very important program.

Proven in battle

Now we get to the BLACK HAWK. It was during FY '84 that this particular piece of equipment got battle-tested. It proved to be all that we had hoped for, and more. I know you may have heard this story, but it bears repeating. During the Grenada operations, one of our BLACK HAWKs took round after round of enemy fire.

Yet it kept flying and doing the job it was designed to do, and it landed safely. Those of you who were in Vietnam wil agree that only a tough and remarkable aircraft can do something like that; the stuff of which legends are made.

The BLACK HAWK has now been deployed to many places around the world, including the Eighth Army in Korea where it is more than proving its worth as a tough and dependable piece of equipment.

ABOVE: Headquarters of the U.S. Army Aviation Systems Command (AVSCOM) are located in the federal complex at 4300 Goodfellow Boulevard in St. Louis, MO.

Ready to fight

I've been talking R & D, modernization, and acquisition. Now let me briefly focus on what we're doing to sustain our fleet — what we're doing to keep our 9,000 rotary and fixed-wing aircraft flying and ready to fight.

The Material Management Directorate is doing a first class job as the **National Inventory Control Point (NICP)** for aviation. If the right spare part doesn't get to the helicopter needing it, we have a major problem, and we spend a lot of effort here in St. Louis trying to make sure that doesn't happen. Last year, the NICP controlled over 49,000 line items worth somewhere in the vincinity of $3 billion. More than 400,000 requisitions were filled. The flow of spare parts is

ABOUT THE AUTHOR
MG ORLANDO E. GONZALES CURRENTLY SERVES AS THE COMMANDING GENERAL OF THE U.S. ARMY AVIATION SYSTEMS COMMAND (AVSCOM) IN ST. LOUIS.

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For aviation support that improves the ground commander's mobility and efficiency, the Boeing Chinook Delta...GOOD NEWS FOR THE COMBAT COMMANDER.

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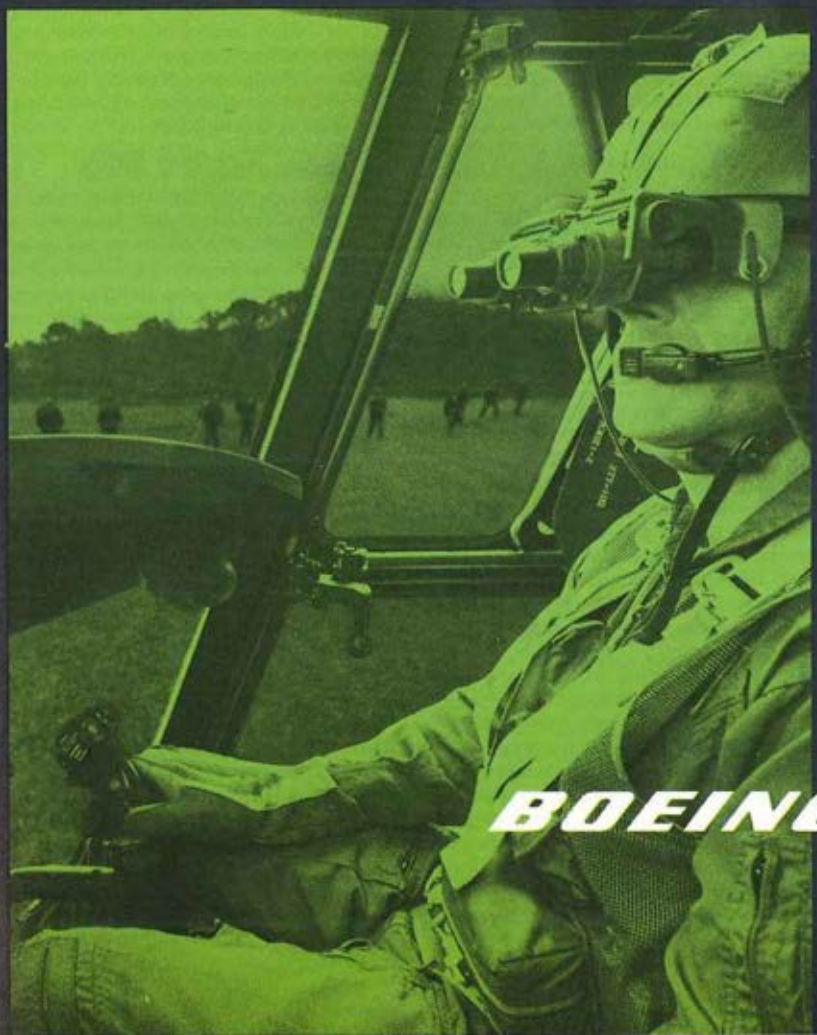


the life blood of our aviation effort, and it's something requiring meticulous attention in order to work. It gets that attention, and it's a program that works very well because of a lot of hard work and dedication.

So, too, is the Directorate for Maintenance doing a good job operating the National Maintenance Point; making sure all our flight systems are provisioned, maintained, and modernized. Field Service representatives served with major units here in CONUS as well as overseas last year, and the directorate also operated a large multi-million dollar overhaul program as well.

I wish I had space in this article to comment about every function and every duty section of AVSCOM. I don't, so let me say simply that the work of every employee is critical and essential to our mission, and every job is being accomplished in an outstanding manner.

Changing faces

We've talked about functions and structural changes. We also had some significant management changes since I have been here as the commander. The former deputy commander for installation support and resource management, **COL Leslie H. Weinstein**, is now at Ft. Hood, TX. His replacement in St. Louis is **COL Charles L. Brown, Jr**. The former chief of staff of the command, **COL Richard F. Ropp**, has retired, and his replacement is **COL Robert A. Wagg, Jr.**, who came to AVSCOM from an assignment at Ft. Rucker, AL. **BG Ronald K. Andreson**, the deputy commanding general for research, development, and acquisition, a former BLACK HAWK project manager, has been named as PM for the LHX project. **BG Michael J. Pepe**, the DCG for readiness and procurement, was recently selected for promotion to brigadier general, and he will continue in his current assignment.

We have a very busy time ahead for all of us. The LHX project is going to demand a lot of attention. With BG Andreson's assignment to be its PM, I think the project is getting off to a very solid and fast start. LHX is an idea whose time has come, and the support of the entire aviation community (which this extremely important program will require) will be well worth the effort.

Also, our force modernization efforts in the coming year are going to mean lots of hectic times for us as we field or plan to field a substantial amount of new equipment and systems. The fielding of the modernized CH-47D, for instance, is well underway with the 101st at Ft. Campbell. It will continue to be fielded throughout the year in CONUS.

The BLACK HAWKs continue to roll off the production line. That program is stable, and both it and the CH-47D have been approved by the Congress for multi-year procurements. The COBRA will be starting the "C-NITE" program, providing it with a much-needed night tow-firing capability as a very essential operational upgrade of that particular aircraft.

The AHIP contract, one of the last things we did in the last fiscal year, is the first production contract for that program. This means, besides finishing the operational testing, we'll be putting it into production, and that it going to require an awful lot of careful attention.

Looking ahead

As we look to the future, there are many areas requiring a special degree of care and concern. We must strive to procure better quality products at a reasonable cost. We have to work harder at integrating our complex systems so as to achieve reduced workloads both inside and outside the cockpit. Human engineering must be considered in every project.

Public law now demands warranty programs for all weapon systems. It's up to us to find clever and innovative ways to make these programs work, not only within the letter of the law but, most importantly, within the spirit intended. We're also going to see greater emphasis placed on the procurement of non-developmental items. We'll be buying more off the shelf, and that's good because it will have the effect of increasing competition, and give us all the benefits of a greater marketplace.

As you can see, the U.S. Army Aviation Systems Command has a full agenda underway with many important things happening. We are pleased and proud to have a dynamic role in the tremendous upgrading that the Army's aviation force structure is experiencing. AVSCOM is manned by excellent people, dedicated to supporting our Army of Excellence, and our future in flight is as high as the sky because we're an important part of the Army family, because we care, and because we, too, are determined to be all that we can be. IIIII

LOOKING BACK: A HISTORICAL YEAR

BY BRIGADIER GENERAL MICHAEL J. PEPE

MILITARY preparedness has been, and will remain, a keynote topic in the private and public sectors of societies throughout the world. Quotations on the subject, which relates closely to what the U.S. Army Aviation Systems Command is all about, can be credited to a number of famous figures in the history of our great nation.

General George Washington wrote that "to be prepared for war is one of the most effectual means of preserving peace" while **President Abraham Lincoln**, in an 1861 letter to the governor of Pennsylvania, wrote: "I think the necessity of being ready increases. Look to it." In a speech at the Naval War College in 1897, **Theodore Roosevelt** remarked that "Again and again we have owed peace to the fact that we were prepared for war."

All of these quotations point to the historically recognized importance of military preparedness, and its linkage to the deterrence of aggression. Some important events relating to readiness have occured over the past few years, and we of the U.S. Army Aviation Systems Command are proud to have been part of the emerging picture of a nation prepared to win whenever and wherever challenged by hostile forces.

Under one roof

For Army Aviation, the past year has been a time of historical significance. It was a time when the total life cycle management responsibility for Army aircraft was pulled back together again under one umbrella — the "new" U.S. Army Aviation Systems Command.

That is not to say that what was done in the past was wrong. What was done a number of years ago regarding the separation of research and development from readiness was right at the time. It was necessary to focus attention on research and development, an area that had been neglected, and marginally funded, for too long a time. Prior to the split, requisite visibility and support for long term Army Aviation state-of-the-art growth and modernization had been sorely lacking. So, in that sense, the separation of the two life-cycle elements was a healthy and successful venture.

But times change, and circumstances today, and into the foreseeable future, again require a reorientation of emphasis. Our Army's future holds significant force modernization and readiness challenges. Meeting them successfully will require close coordination and centralized orchestration of the full range of Army Aviation life cycle disciplines and skills.

An Aviation Systems Command orientation, and a new perspective, are neccessary if we are to transition successfully through the force modernization era without readiness degradation. It is essential if we are to ensure maximum support to our Army at any time, anywhere throughout the world, as our national command authority may require.

How are we doing?

How would I assess the new AVSCOM's inaugural year? I believe it can appropriately be described as a dynamic year which saw the reorientation of our entire workforce, a turbulent year, a most challenging year, and surely a year of renewed personal commitment. Yet it was also a year interwoven with unprecedented mission successes.

We reorganized and restructured to re-unify the two aviation life-cycle elements: R & D/

Acquisition and Readiness. Our mission is now Aviation Systems Management from cradle to grave — from initial R & D right through to the mothballing of excess aircraft. And the way we do busines is also changing. We tackled the challenges of our new mission with a commitment to improve the way in which we negotiate and execute contracts. We're insisting — individually and collectively — on the best possible deal for the money we spend.

We were caught in a double bind this past year: we had to learn how to operate from an aviation life cycle perspective, while relearning systems acquisition management from this changed perspective.

There were also challenges associated with the increased attention directed at Government procurement practices. The spin-off included both increased interest in our contracts history, and renewed self-assessment of our internal business practices and procedures.

The full gamut

Our concerns and interests spanned the full gamut, qualitative and quantitative, of systems acquisition contract management performance indicators:

- from generation and commitment of funds to contract execution and funds obligations;
- prices paid to test for fairness and reasonableness;
- indicators or perceptions of potential fraud, waste, or abuse in contracting processes;
- spare parts contracting methodology and initiatives;
- parts breakout to increase competitive contracting and small and disadvantaged business participation in satisfying our materiel needs; and so forth.

Back-to-back internal reviews came to be expected. Auditors and inspectors were an accepted extension of the Command's Central Procurement Activity staff. Still, in spite of it all, 1984 was a year of success and accomplishment for the entire AVSCOM community. We weathered the storm with a clean bill of health. Unprecedented accomplishments were netted for Small and Disadvantaged Business participation in contracting for our materiel needs. Few perceptions of questionable past pratices were identified, and none were substantiated. Substantial savings were accrued as a result of our **Spare Parts Initiative (SPRINT)** in contracting which freed up dollars for reinvestment into additional readiness enhancement flying hours for our soldiers in the field.

The dust has settled

For the most part, the dust here in St. Louis has settled. Our reorganization is complete except for some minor adjustments. And, in conjunction with the U.S. Army Materiel Command's Major Subordinate Command Team, your new AVSCOM is spearheading aviation logistics support flying hour initiatives to enhance and sustain our proficiency triad of Army Aviation Readiness — individual aviator proficiency; aviation unit proficiency; and combined arms proficiency.

There was a lot of learning going on here during our inaugural year, in addition to a lot of doing. There is no question that the new AVSCOM organization, capitalizing on the lessons learned, will enable us to do a better job supporting our total Army's readiness posture, and will add substantially to our total Army of Excellence!

We here in AVSCOM are aware of, and senstive to, our vital role in protecting our Nation's security.

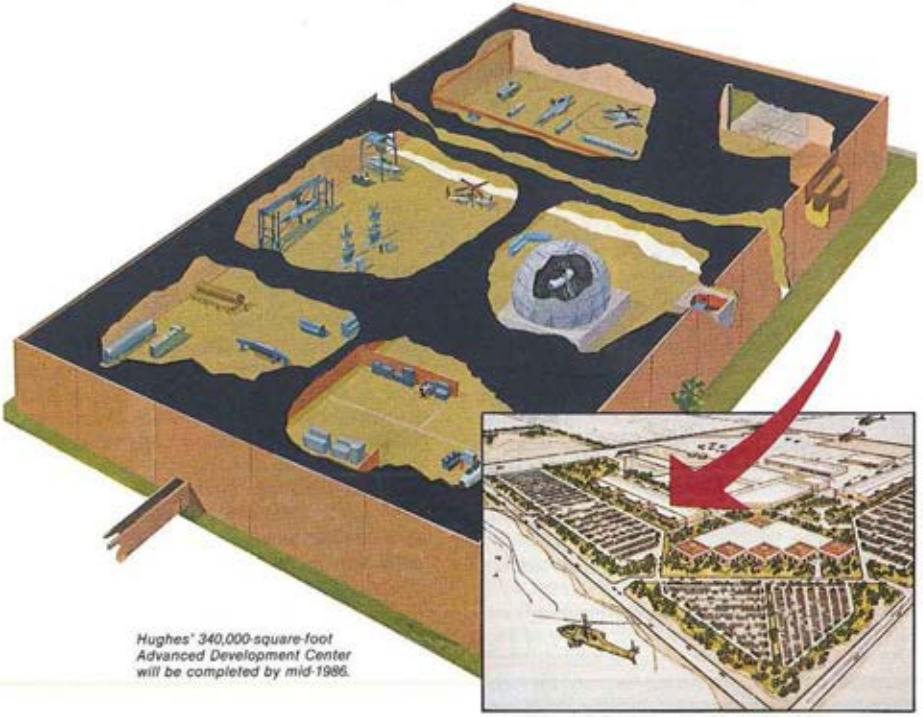
AVSCOM employees are proud of their contributions in support of uniformed men and women throughout the world who daily make personal sacrifices so that our great nation will continue to live in peace and freedom.IIIII

ABOUT THE AUTHOR
BG MICHAEL J. PEPE SERVES AS THE DEPUTY COMMANDING GENERAL FOR PROCUREMENT AND READINESS AT THE AVIATION SYSTEMS COMMAND.

LHX AND BLACK HAWK

Two important programs managed by the U.S. Army Aviation Systems Command are not included in this edition of ARMY AVIATION because they will be covered in-depth later this year. Our June 30 issue will be devoted to an examination of the Light Helicopter Experimental (LHX) development program, while our August-September edition will focus on the worldwide acceptance and use of the UH-60A BLACK HAWK.

LHX and the new Hughes Helicopters.



Hughes' 340,000-square-foot Advanced Development Center will be completed by mid-1986.

Artist's rendering of new Hughes facility at Mesa, Arizona.

Now the commitment is greater than ever

This is the *new* Hughes Helicopters at Mesa, Arizona, where work begins on a masterplan that calls for an additional 1.3 million square feet of factory, laboratory and office space.

Included is a giant 340,000-square-foot Advanced Development Center. It is to be completed by mid-1986 and consists of engineering laboratories, simulation facilities and prototype assembly.

As Hughes Helicopters' work in support of the U.S. Army's LHX Program moves toward full mission simulation, the company is more committed than ever to meeting the biggest challenge in the history of rotorcraft. That challenge is the development of a new family of helicopters to support Army 21. A new and technologically advanced generation of rotorcraft that could help the Army fight and win on a battlefield of the 21st century.

The Hughes commitment is more than a matter of facilities. It is people. It is dedication. It is belief in the Hughes LHX Team effort. It is a commitment that is greater than ever.

Hughes Helicopters, Inc.
Culver City, California 90230
A Subsidiary of McDonnell Douglas

TECHNOLOGY'S ROLE IN ARMY AVIATION

BY MR. CHARLES C. CRAWFORD

AS the first Technical Director of the newly established U.S. Army **Aviation Systems Command (AVSCOM)**, I have a once-in-a-lifetime opportunity: that is, to insure a direct relationship between the labors of our most intelligent scientists from our laboratory complex, and the greasy rag mechanic busting his "behind" to insure a readiness posture for Army Aviation that will represent such a deterrent to aggression that our kids will never miss a Saturday afternoon football game.

A way of life

The Army Aviation community has always considered itself to be among the best. On many occasions, I have advocated that working in Army Aviation is not a job, but a way of life. The recent reorganization into a total aviation systems command merely represents a new formation with a better way of attacking problems with our many talented and dedicated people. From the ever-increasing talent of our experimental test pilots, through our laboratory engineers with their ability to understand those mysterious rotary wing aircraft, to the "smart buyer engineers" who prepare the performance oriented specifications and qualiification requirements, the quality of our work is better. The challenge for better products from our industry at lower prices has been on the rise. I believe the improvements achieved are unequaled for other commodities used by our soldiers.

To project the future, it is appropriate to review a few specifics of the past. I think four areas are worth a few minutes to consider. You must first agree that:

A. Basic rotorcraft represent the ultimate challenge in aerodynamic complexity;

B. Rotorcraft tax the technical competence of structural engineers to the limit as they attempt to provide safe structural integrity with cost effective retirement lives of fatigue critical parts, all at the lightest practical weight;

C. These systems stimulate the need to reduce inherent vibration levels to insure acceptable reliability with crew comfort levels that do not compromise pilot workload in the combat environment;

D. Rotorcraft also mandate attention to the art of designing troublefree engine and drive systems that can be so vulnerable to high cost and unacceptable maintainability.

The going gets tough

The integration of complicated but essential mission equipment is a tough job for any aircraft, but is made tougher by the vibration and weight control issues associated with rotorcraft.

In spite of the above complexity, the key to success of our recent major development efforts (UTTAS, AAH, and AHIP) has been our 6.2 exploratory development and 6.3 advanced development laboratory demonstrator programs. While many of the ideas actually originated in industry through their **independent research and development (IR&D)** efforts, they were augmented by Army laboratory funds. The successful flight demonstrations of advanced hardware configurations have been the key. I cannot think of a demonstrator program more successful than that which led to the T700 series engines for UTTAS/AAH. Comparable engine demonstrator programs should lead to equally successful advanced propulsion units for the JVX and LHX. From the "success story" perspective, flight demonstrations of the XV-15

tilt rotor are without precedent. However, thinking back, the company-funded SIOUX SCOUT and COBRA demonstrators led the way to our attack helicopter concepts and successful AH-1 series. The current **Advanced Composite Aircraft Program (ACAP)** and **Advanced Digital Optical Control System (ADOCS)** are the most noteworthy efforts in support of the development of an LHX that will meet the Army's "light" objectives. It took a substantial marketing effort to acquire the necessary DA, OSD, and Congressional support for the above programs. Our success was due to the wise efforts of **Dr. Richard M. Carlson**, Director of the Research and Technology Laboratories.

The challenges ahead

The challenge of the future for our technical specialists are to find new ways to develop even more capable Army air items, in a shorter period of time, at a reasonable development cost, with an aim toward absolute assurance of affordable production costs. In addition, technology must close the gap between the increased complexity of the hardware/software and the expected talents and facilities of our maintenance personnel. The Congress has a right to expect that the funds they make available for improved technology will produce better weapons at a lower operating cost.

When we consider the complexity that must be added to insure operation under all likely combat environment (adverse weather) conditions, day and night, and against the sophisticated threat that the Soviet Bloc is capable of producing, we have not defined an easy task.

The only practical opportunity to shorten the full-scale development phase for the types of equipment mentioned above is to accomplish significantly more risk reduction efforts during a pre-full-scale development or preliminary design phase. Our most recent major developments have required many significant design changes after initial flight in order to meet the original program objectives.

Lessons to be learned

In this regard, a lesson can be taken from the risk reduction approaches for the recent development of commercial jet transports. Boeing advises me that they actuallyconducted in excess of 15,000 hours of wind tunnel testing during the preliminary design phase for their 757/767 jet transports. Even after a go-ahead decision for full-scale hardware, the detailed design phase contained testing of about the same magnitude. This meant that the FAA type certification work was predominantly a validation effort.

The simulator is even a more powerful tool than the wind tunnel in that it provides the technical community the opportunity to optimize the flight path management system (flying qualities) with the controls and displays necessary to operate the mission equipment. More importantly, the simulator offers the opportunity to involve user pilots in the process before the overall configuration is established. Using the simulator, optimization of the flight characteristics and the man-machine interface can be accomplished on a multishift basis, before any commitment to hardware. Making it work in flight test is limited substantially by weather conditions, downtime of the aircarft and, frequently, hardware versus software changes.

Supporting the field

So much for the research, development, and qualification process. Now let's look at our operation for engineering support of fielded aircraft. The newly organized AVSCOM can more

ABOUT THE AUTHOR
MR. CHARLES C. CRAWFORD CURRENTLY SERVES AS THE TECHNICAL DIRECTOR FOR THE U.S. ARMY AVIATION SYSTEMS COMMAND.

ABOVE: Testing voice recognition hardware is part of the voice interactive avionics technology program conducted at AVSCOM's Avionics Research and Development Activity (AVRADA) at Ft. Monmouth, NJ.

easily bring to bear substantial technical talent to address significant problems in the field. We recognized that the government engineers who actually participate in the development of our new air items must be more responsive to the correction of problems, should they occur. It is a matter of priority of the engineers' time. **MG Gonzales** has made it extremely clear that support of the field must come first. Fortunately, our organizational structure makes this substantially easier than the structure of the past.

The support of fielded aircraft, however, can also be significantly augmented by a futuristic look at logistics during the R & D phase. The new concept of logistic research and development is gaining momentum and promises substantial payoffs. It covers all phases of the R & D program and is designed to overcome generic logistic support deficiencies, logistic deficiencies related to weapons systems, logistic deficiencies related to AMC depot and industrial base activities, and gaps in analytical methodology required to improve logistic support functions throughout the life cycle. Logistic R & D does not have separate budget program element, but is part of normal **research, development, test, and evaluation (RDT&E)** planning, programming, budgeting and execution process. Logistic R & D will be flagged as a special interest item for RDT&E annual review.

Independent research

I've already mentioned the significance of the Department of Defense's program of Independent Research and Development by our industry complex. The objectives of this process are to:

A. Strengthen company technology base while maintaining specific focus on high potential product areas.

B. Enhance and expand company product lines.

C. Maximize degree of technology transfer between company product lines.

D. Maintain technical excellence in all company products.

E. Strengthen customer ties and company technical image.

As the R & D funds available to AVSCOM for other than full-scale development programs become harder and harder to get, we must place increased emphasis on our ability to guide the independent R & D being performed by industry. This turns out to produce a two-fold situation. As our laboratory complex conducts competitions for their exploratory development and advanced development efforts, we find unsuccessful competitors establishing equivalent programs within their own R & D efforts in order to remain competitive. By the same token, we can avoid dedicating scarce Army money toward those technological areas that are adequately covered by industry with the Army seed money. Such a situation mandates that we make an effort to insure that we are aware of industry's activities through an active review of their plans. While the regulations require that their work be genuinely independent research, government reviews are formally established as a part of the process.

Our major objectives

In summary, our recent reorganization into a functional Aviation Systems Command allows us to rededicate ourselves to several important objectives:

- Enhance our tech base program by being more cognizant of the private sectors' work through independent R & D programs.
- Pull technological opportunities out of tech base and push them into the development stream.
- Perform sufficient technical risk reduction efforts in the predesign phase to shorten the most expensive full-scale development phase and insure that our air items fly "off-the 'drawing-board' " without time-consuming changes in flight test.
- Enhance the supportability of the troops in the field by considering logistics from the earliest preliminary design effort.
- Emphasize closing the gap between increasing complexity and the availability of maintenance talent through the use of artificial intelligence techniques.
- Support the soldier in the field by getting the technical specialist who fostered the technology in the beginning, and the engineers who validated it during the qualification process, involved in resolving difficulties during service.

The above process should and will improve safety, increase combat effectiveness, and reduce the cost of ownership for each and every Army air item. IIIII

Keep your Hellfire in Sight with the CMA-874

Modern weaponry such as the Hellfire Missile can now provide all-weather, day-and-night capabilities. But no level of sophistication can let you afford to lose touch with your weapons system — effective control can be half the battle, particularly on close air support missions.

The Canadian Marconi CMA-874 Hellfire Control and Display Subsystem keeps your Hellfire in sight. Suitable for the most demanding missions, the CMA-874 is lightweight and small enough to fit into today's crowded cockpit, right up front where you need it. It features sunlight-readability and full compatibility with the latest in night vision aids, without the need for 'quick fixes'. The displays are clean and organized, with the right display presented at the right time without the need to reselect from a multi-function display. Easy-to-read, comprehensive graphics and automatic adjustment of display brightness ensure that you get the information you need, every time.

For further information on how the CMA-874 Hellfire Control and Display Subsystem can keep your Hellfire in sight, contact:

CMC

Canadian Marconi Company
Avionics Division

2442 Trenton Avenue
Montreal, Quebec
Canada H3P 1Y9
Tel: (514) 341-7630
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ENGINEERING FOR EXCELLENCE

BY MR. RONALD E. GORMONT

AVSCOM's Directorate for Engineering pulls the total base of Army Aviation engineering support into one organization. This new directorate was formed from the engineering resources of the Development and Qualification Directorate and the Systems Engineering and Development Directorate at the old Aviation Research and Development Command (AVRADCOM) and from the Maintenance Engineering Division of the Directorate for Maintenance at the Troop Support and Aviation Materiel Readiness Command (TSARCOM).

A full range of support

The Engineering Directorate's mission covers the full range of engineering support including initial requirements definition, development of new systems, and support of the fielded Army Aviation fleet.

The concept and function of the Engineering Directorate maximizes the use of all engineering resources and provides the most efficient support throughout the total life cycle of aviation systems. The directorate is geared to be responsive not only to **project managers (PMs)** during development stages, but also to PMs and weapon systems managers responsible for fielded systems, and to outside test agencies and operational units in the field. Management and functional engineers within the organization benefit from this approach by being exposed to situations and problems which arise throughout the life cycle of the system. Exposure to these day-to-day problems enable these engineers to better assist in designing and supporting future systems.

Some of the more important features to this approach are:

- The directorate, as the functional technical organization, is responsible for an air item throughout its life cycle. Previously, technical responsibility for the item was passed from one organization to another at various points in its life cycle.
- More resources are dedicated to providing functional technical support in lieu of engineering management. With 25% of engineering personnel focused on engineering management and 75% assigned to functional technical support, a significant number of engineering personnel are actually dedicated to identifying and resolving technical problems related to Army aircraft.
- Functional specialists, and not management, are now involved in resolving technical problems.
- The larger functional structure affords more opportunity to recruit new engineering talent and to train them in on-the-job situations, thus providing a continuing flow of new resources to staff the organization.
- A team leadership concept is used to supervise small groups of technical experts in a particular discipline which allows one-on-one communication with the industry team.
- The Engineering Directorate is technically accountable for approval of airworthiness qualification for components, subsystems, and systems and issues airworthiness qualifications in accordance with AR 70-62, "Airworthiness Qualification of U.S. Army Systems."

Organizational structure

The Directorate for Engineering is made up of seven divisions:

The **Plans and Programs Division** is the fis-

ABOVE: The Aviation Life Support Equipment (ALSE) shown here is under development for the Army by the Directorate for Engineering at AVSCOM.

cal, program analysis, and administraive division within the directorate.

The **Systems Integration Division** provides systems engineering management for the Army's fielded aviation systems. Teams within this division interface with other AVSCOM offices and outside agencies. For those programs that are project managed, the chief of the Technical Management Division in the respective project manager's office is the systems engineer for the air item. For programs that are not project managed, the systems engineer resides in the Systems Integration Division of Engineering. All activity or engineering support requirements for a particular system flow in or out of the directorate through teams working in this division. They ensure that a fully coordinated position is developed before action is taken.

The **Development Projects Division** consists of teams organized to support development projects which have not yet been fielded. The newest of these is the LHX team which supports the development program for the family of light helicopters. This division also includes several special efforts such as the test and evaluation team that provides coordinated command positions to outside test activities, and day-to-day staff supervision of AVSCOM's Engineering Flight Activity at Edwards Air Force Base, CA, and engineering support for special operation activities involving use of nonstandard equipment and installations for response to quick reaction programs or special mission requirements.

The **Logistics Engineering Division** represents a new emphasis on logistics support of fielded systems. This is a first for this phase of technical support to receive such a high level of visibility within an engineering organization. This division includes technical experts for full range support of **Ground Support Equipment (GSE), Test Measurement and Diagnostic Equip-**

ABOUT THE AUTHOR

MR. RONALD E. GORMONT, FORMER ACTING DIRECTOR FOR ENGINEERING AT AVSCOM, NOW SERVES AS CHIEF OF THE ADVANCED CONCEPTS DIVISION IN THE ADVANCED SYSTEMS DIRECTORATE.

ment (TMDE), Automated Test Equipment (ATE), Training Aids, and **Reliability Centered Maintenance (RCM).**

The RCM and Depot Engineering Support group, physically co-located with the Depot Systems Command's Corpus Christi Army Depot, TX, provides direct day-to-day engineering support to the overhaul activity and critical training and program definition for the **Aircraft Condition Evaluation (ACE)** Program, currently being used to identify fielded aircraft for priority induction into the overhaul line. The new addition to this division is the breakout responsibility for increasing competition and reducing costs of replenishment spare parts.

Parts standardization, item reduction studies to eliminate proliferation of peculiar parts, and Value Engineering responsibilities are also assigned in this division. Value Engineering is targeted at reducing the cost of acquiring and operating our aircraft weapon systems.

The **Subsystems Technology Division** provides dedicated support to subsystems found on current Army aircraft by focusing on highly automated and computer driven applications of future systems. For example, man-machine interface encompasses maintenance features and utilization of high technology ground support equipment as well as cockpit integration. Emphasis is placed on new designs that take into consideration the physical restrictions and capabilities of user personnel. As Army aircraft become more and more electronic in nature (fly by wire flight control systems, multiplexing the operation of the mission equipment, etc.) this division recognizes the growing need to shift emphasis from aeronautical/mechanical engineering to electrical/electronic engineering.

The Subsystems Technology Division also works toward development and application of software to run on-board and ground-based computers for the battlefield of the future.

The **Propulsion Technology Division** is responsible for basic engine technology, engine project engineering, engine installation, drive systems, and fuel system technology. This effort includes installed auxillary power units and the interface of these equipments with the aircraft system. Currently, this division is providing a significant base of support for the development and acquisition of the T800 engine for the LHX. The **Component Improvement Program (CIP)**, aimed at identifying improvements to incorporate into fielded engines to reduce costs and extend operation, is also handled by this division.

The **Air Vehicle Technology Division** provides remaining technical support for the air vehicle. This includes responsibility for flight performance, flying qualities, stability and control, flight control systems, weight and balance evaluations, and support for **Product Improvement Proposals (PIPs)** and other modifications. Division personnel also have responsibility for structural integrity of Army air items and they determine retirement lives for all critical life limited parts on the air vehicle.

New thrusts, some of which have already been mentioned, can be grouped into two main areas: support and operation of our current equipment and preparations to deal with the battlefield of the future.

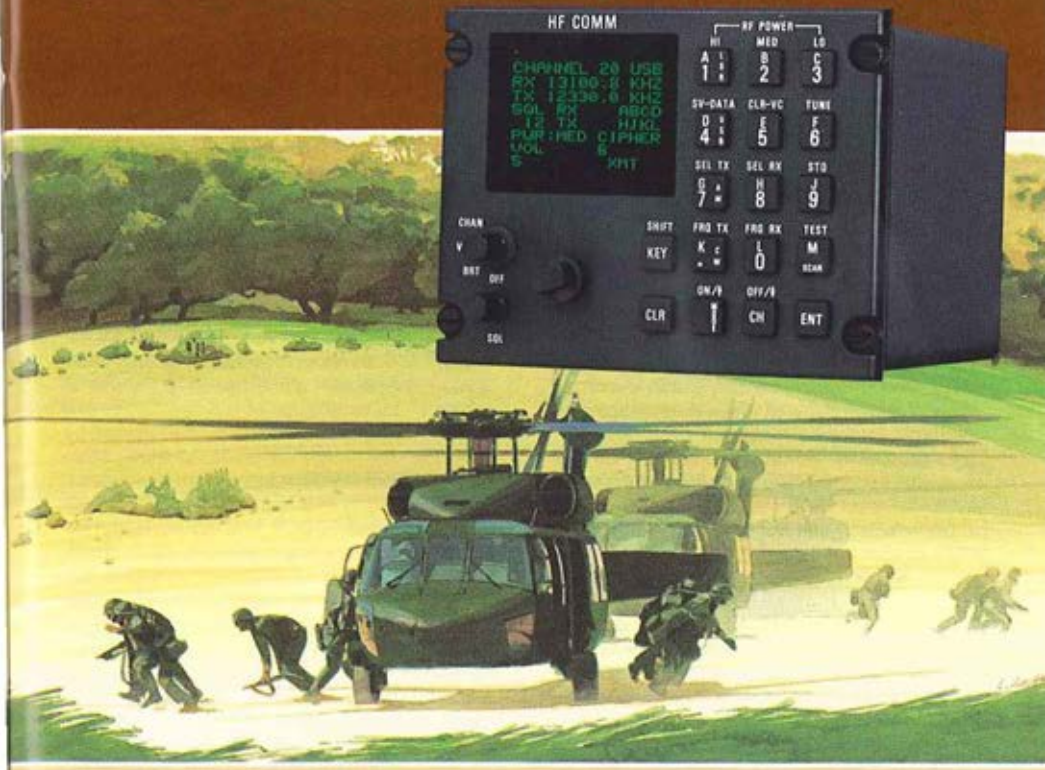
Our spare parts initiatives are necessary to reduce costs as are efforts to insure that system designs are consistent with the overall philosophy of acquiring sufficient technical data and design approaches amenable to future breakout and competitive procurement. The Value Engineering and Component Improvement Programs are also aimed at reducing cost of ownership, cost of internal Army operations, and cost of operation of our fielded systems.

Preparations for the battlefield of tommorrow include increased development of noncomplicated equipment for man-machine interface, and the new generation of automated equipment with its related computer software-driven technology requirements.

It's paying off

The reorganization efforts of AVSCOM's Directorate for Engineering are paying off with increased efficiency and effectiveness. Our concept of assigning teams of experts to various technical disciplines is proving to be a superior approach for applying talent to the task at hand. Our increased manpower in functional areas, combined with reduced manpower in technical management areas, is maximizing our ability to analyze and resolve technical issues. The Directorate for Engineering is structured to consolidate the base of technical support for Army Aviation and actively participate in developing Army Aviation for the future. IIIII

KING RADIO'S AN/ARC-199 THE LATEST WORD IN TACTICAL HF



For more than a year King Radio engineers have been busy developing and testing the latest word in HF capability: the AN/ARC-199.

When the first units enter the U.S. Army inventory, they will provide Army helicopters (including the UH-60 Black Hawk, OH-58 Kiowa, the CH-47D Chinook, the new AHIP and the UH-1 Huey) with advanced radios for the demanding nap of the earth (NOE) mission.

What does the U.S. Army find so appealing about King HF? Several features make the AN/ARC-199 stand out. One is the MIL-STD 1553B data bus interface which provides compatibility with the new avionic systems architecture. Other points in King's favor include the small size and light weight of the AN/ARC-199 (approximately 30 pounds for an installed system) and the reliability associated with King equipment. These weight and space savings allow for the addition of other mission payloads.

Utilizing four microprocessor chips, the AN/ARC-199 is able to automatically scan 20 preset channels and to automatically recognize incoming voice calls by their addresses. Add to these features selective squelch, BITE, variable power output, secure voice and data capability plus the growth potential for frequency agility, frequency link analysis, automated communications and electronic operating instructions—and you have the potential of a truly ADAPTIVE HF SYSTEM.

King Radio Corporation has also developed the companion radio to the AN/ARC-199—the AN/VRC-86. This radio, which is functionally identical to the AN/ARC-199, will be installed in Army vehicles. Both radios work with telephone-like simplicity to allow helicopter pilots to keep in touch with ground forces during tactical operations.

Since winning this U.S. Army contract over a year ago, King Radio's successes in tactical HF haven't gone unnoticed. Another HF contract has already come our way—this time to build an advanced HF for use in the rugged operational environment of tactical fighter aircraft. King is developing the AN/ARC-200 (a derivative of the AN/ARC-199), which will be used in an RAAF version of the F/A-18 strike fighter aircraft.

If King's tactical HF story interests you either from the standpoint of off-the-shelf products or adaptations of the systems we are building, contact: Director, Special Programs Department, King Radio Corporation, 400 North Rogers Road, Olathe, Kansas 66062. (800) 255-6243. Telex WUD (0) 4-2299. Cable: KINGRAD.

KING

DAS: AVIATION'S R & D MANAGERS

BY MR. GARY L. SMITH

THESE are exciting and challenging times for all of us in Army aviation. Never before have science and technology offered the Army so many opportunities to exercise innovative materiel acquisition strategies and, at the same time, provide the troops with advanced aviation equipment with which they can counter the threat on the battlefield.

As Director of Advanced Systems, I am enthusiastic about being a part of the professional AVSCOM team dedicated to bringing the fruits of our research and development efforts to full scale aircraft production.

Our primary mission

Briefly stated, the mission of the **Directorate for Advanced Systems (DAS)** is to serve as a special **research, development, test and evaluation (RDT&E)** staff for the Commander and the Technical Director, with primary responsibilities for planning and coordinating the RDT&E and materiel acquisition processes and for their integration into the **Planning, Programming, Budgeting, and Execution System (PPBES)**. This is the DOD resource allocation system. It integrates threat forecasting, strategy, requirements, programs, budget, and funding. In other words, it is a management tool to discipline the resource allocation process and it serves as a vehicle to define, examine, and change what the Army does.

GEN Richard H. Thompson, Commander of the **Army Materiel Command (AMC)**, has established a dynamic and aggressive program for pursuing a "new way of doing business" in achieving our Army goals. The PPBES management tool allows the flexibility to incorporate AMC's initiatives and make the long-needed improvements to our life cycle management process. **MG Orlando E. Gonzales**, AVSCOM Commander, has challenged his laboratories to provide milestone-oriented schedules for research and development including tech base areas. This action will establish a "sense of urgency" for completion of R & D activities and insure that the demonstrated technology will be available for timely insertion in **Full Scale Development (FSD)** weapon system programs.

DAS functions as a management element, orchestrating the PPBES and coordinating the RDT&E process. Under the previous organizational structure (AVRADCOM - TSARCOM), this role was difficult to execute; however, through integration of the total "cradle-to-grave" aviation commodity planning process provided by the recent reorganization of AVSCOM, DAS's role as a single focal point for **Research, Development, and Acquisition (RDA)** has greatly improved.

A full range of support

The Advanced Systems Directorate now provides full support to the combat developer for materiel needs and informs TRADOC of development technology opportunities which can be made available to accomplish the user's needs. Another area of major improvement since the reorganization is in the synchronization of the **Army Materiel Plan (AMP)** with the DA Long Range Plan and the AMC RDT&E Spring Review. This coordinated planning effort contributes to building the Department of the Army's **Program Objective Memorandum (POM)** and **Extended Planning Annex (EPA)**.

Combining the aviation RDA planning process in a single organizational element mini-

mizes confusion and the waste of valuable resources and maximizes the coordination which determines a unified command position.

Coordination of the RDT&E process requires a systems integration effort which begins in the planning phase, and continues through the programming phase, with emphasis on the budgeting phase, and continual monitoring during the execution phase.

The **Requirements Analysis Division** of DAS has the primary responsibility for planning,which can be defined as charting a plan of action to achieve specific objectives. The planning process in the Army has been founded upon the AirLand Battle Doctrine which was developed by the TRADOC community. This Doctrine drove the **Mission Area Analysis (MAA)** conducted by the TRADOC centers. The Army Aviation MAA was completed by the Aviation Center in January, 1982, and identified Army Aviation deficiencies for correction.

AVSCOM supports the AAMAA by identifying technological opportunities for Army Aviation in the '80's and '90's and candidate materiel solutions to deficiencies. Concurrent with the user community's AirLand Battle Doctrine and AAMAA efforts, the development community has been aggressively developing a hierarchy of DA, AMC, and Army Aviation systems long-range research, development, and acquisition plans.

Vital planning

DAS is responsible for the coordination and synchronization of the following plans for AVSCOM:

- The **Army Aviation Modernization Plan** is the master planning document for future aviation requirements. The Plan provides guidance for both users and developers to insure requirements and goals can be understood and supported. The Modernization Plan includes objectives and program planning data required to develop, procure, and maintain an aviation force responsive to currently projected aviation roles and missions to counter the threat. The AAMAA is based upon threat doctrine that utilizes aviation as an integral component of several mission areas of the AirLand Battle. By using the Modernization Plan and the AAMAA to establish priorities for our RDA programs, the developer and user together can fully articulate and support the total aviation program. DAS will publish and distribute the Modernization Plan for the Office of the Deputy Chief of Staff for Operations during FY '85. It is also important to note that the Plan is consistent with the DA Long Range RDA Plan procurement data.
- The **DA Long Range RDA Plan** provides POM and EPA summaries for **aircraft procurement Army (APA)** and RDTE appropriations by procurement **Standard Study Number (SSN)** and RDTE project number. This plan is a tool to discipline the resource allocation process and serves as a baseline for preparing the POM. It also insures that technology is available for the orderly development of Army aviation systems.
- The **AMC Long Range RDA Plan** provides greater detail on the RDTE programs contained in the Da Long Range RDA Plan. The AMC Plan describes technology products from the tech base program, identifies developmental efforts down to the work unit level in advanced and engineering development, and includes related procurement costs for those developmental efforts.
- **AVSCOM's RDT&E Plan**, a DAS-proponent publication, documents the 20-year plans of the Army Aviation community to develop technology, equipment, and subsystems for potential application to Army aircraft. The Plan is the culmination of a comprehensive threat survey, a technology forecast by both Government laboratories and industry, an assessment of the Army Aviation Modernization Plan, and a review of the Project Managers and the combat developer community for relevancy. It has served as a useful planning tool to all of these participants, and fully supports the DA and AMC Long Range RDA Plans. Over the past year, the Plan has proven itself as a basis for the management/investment strategy for aviation and will continue to be one of the key AVSCOM management guides.

Some important programs

Over the recent past, the DAS was deeply involved in formulating the LHX program. That program has now transitioned to a Project Man-

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SCIENCE/SCOPE

The airborne TOW missile system can be carried by many different helicopters for assaulting tanks, bunkers, small boats, ground installations, and other hard targets. The system is carried on the AH-1 Cobra series of the U.S. Army and Marine Corps. It also is installed on the Hughes Helicopters 500 MD, the Italian Agusta A-109, the Bell Helicopter TEXTRON 206L, the United Kingdom's Westland Lynx, the German Messerschmitt-Boelkow-Blohm B0105, and the Sikorsky AUH-76 aircraft.

The system incorporates a stabilized sight, which permits the gunner to simply fix his cross hair on the target and fire. The TOW missile is guided automatically to the spot where the gunner is sighting, receiving steering signals through two wires it unreels in flight. The pilot may fly at varying speeds and conduct evasive maneuvers without affecting the missile's flight. Hughes Aircraft Company has produced over 1,000 airborne TOW missile systems.

A laser device guided a Hellfire missile to a direct hit in firing trials involving the British Army Lynx helicopter. The tests were the first launches of the American-built antiarmor missile by a non-U.S. helicopter, proving the interoperability of NATO systems. The target was pinpointed by a Ground/Vehicular Laser Locator Designator (G/VLLD) from 4.6 kilometers away.

The Hellfire used reflected laser light to home on the target. G/VLLD is a combination rangefinder and target designator designed for use by forward observers. It can be mounted on tripods or vehicles. Hughes builds G/VLLD for the U.S. Army.

For more information write to: P.O. Box 11205, Dept. 65-5, Marina del Rey, CA 90295

HUGHES
AIRCRAFT COMPANY

ager's Office and it is time to get on with future work which will include block improvements to the UH-60 BLACK HAWK and the AH-64 APACHE. Major improvements can be made in these systems by incorporation of today's avionics, weaponization flight control, and fire control technologies.

Expanding capabilities of **Unmanned Aerial Vehicles (UAV)** are making them much more important on the high threat battlefield. Other future Army Aviation programs are on the horizon. Our office is always anxious to listen to new ideas from industry for new systems responding to user needs. In that light a standing offer is out to industry to brief your new ideas and concepts to us.

From the programming standpoint, the **R & D Resource Analysis Division** principally emphasizes the programming and budgeting functions in its role as the RDT&E program administer, but also gets involved with the execution function through the coordination of reprogramming actions with the AVSCOM Comptroller during the year of execution. It acts as the Command focal point in distributing guidance and information for higher headquarters Annual Review requirements and consolidates and submits Command input for the **Modernized Army Research and Development Information System (MARDIS)**.

Both the annual review results and the MARDIS are utilized by AMC and DA in the formulation and support of the President's budget and the POM necessary for out-year RDT&E aviation program development. The review process concentrates on the forthcoming fiscal year with issues being formulated for interaction with the POM in the succeeding (budget) fiscal year. This review process also feeds the MARDIS data base which covers the current fiscal year, budget fiscal year, and target POM year period (five years). Both these program devices serve to grease the wheels of the programming and budgeting process. Add to this the ongoing work associated with RDT&E planning development as it interfaces with the developer, user, and higher headquarters communities and the total process is rounded into the PPBES.

ABOVE: The OH-58D AHIP advanced scout helicopter, shown here with its unique Mast-Mounted Sight, is one of several new systems currently under development by the Aviation Systems Command.

The **Advanced Concepts Division**, while involved in planning, also initiates programming. This programming function is designed to insure the availability of resources necessary to execute the plan. The concept managers prepare the POM and EPA inputs for their concepts and work with the user in developing the supporting requirement documents, such as the **Justification for Major System New Start (JMSNS)** which must be submitted with the POM.

The **Systems Technology Division** is principally responsible for the programming function through overseeing the prioritization of the RDT&E program in association with TRADOC. This division is functionally organized by technical discipline: aeromechanics, propulsion, struc-

tures, avionics, weaponization, safety and survivability, visionics, mission equipment, aviation life support, and systems integration. The personnel of this division serve as technology representatives for the laboratories and other functional elements in the Command, and also handle budgeting and execution functions in their roles as coordinators for system integration.

New responsibilities

Since AVSCOM's reorganization, the responsibilities of the Directorate for Advanced Systems have expanded to include acquisition. Employing the management philosophy that "business as usual is **not** the norm," DAS is investigating new management procedures to support AMC's aggressive initiatives in compressing the acquisition cycle. The following highlights some of these actions:

- The **AVSCOM Acquisition Strategy Panel** has been operational since March, 1984. This panel, composed of our top level management experts, is a primary vehicle to streamline and tailor the acquisition cycle for each major system. However, tailoring the acquisition cycle is only the beginning. As this acquisition panel evolves new initiatives, each materiel system will benefit substantially through timely research and development, qualification and validation.
- Systems requirements documents may contain requirements which are not technically feasible, or are so vague that they are subject to misinterpretation, or may dictate technical solutions which are not producible, affordable, or supportable. The **Systems Requirements Review Board**, chaired by the Technical Director and composed of senior representatives from the other functional elements, will be established with two primary objectives: to perform independent assessments of draft requirements documents to establish a command position prior to final negotiations with user representatives, and to perform independent assessments of draft System Specifications prior to the Request for Proposal.

This policy in no way infringes upon the PM's responsibility to plan and execute the total program for his assigned system. The board will provide an independent assessment and evaluation to the Commander and provide advice and assistance to the PM, while providing a basis for command agreement to the requirement.

The DAS also plays an important role interfacing with industry in support of our aviation requirements. The **Requirements Analysis Division** serves as the single focal point within AVSCOM for all **unsolicited proposals (USP)** and is responsible for the **Small Business Innovation Research (SBIR)** Program.

The USP program provides an avenue by which industry can propose novel solutions addressing the deficiencies or needs of Army Aviation as perceived by the submitter. The SBIR program, which is aimed at firms involved in high technology, and is reserved for small businesses, was mandated by Congress in 1982. Under this program, small business concerns propose specific solutions to needs published in the form of research topic descriptions. AVSCOM's descriptions are included among others in an annual DOD-wide solicitation distributed by the Defense Technical Information Center each fall.

Independent Research and Development (IR&D) is a normal business expense for all technology-based companies which must maintain active in-house R & D programs if they are to respond to changing customer needs. The overall DOD intent in supporting IR&D is to encourage the evolution and maintenance of a strong and creative industrial base from which DOD can draw new concepts and rapid responses on a competitive basis for its military requirements.

DAS serves as the focal point for IR&D for the Command. We feel that the IR&D program is very important to the future success of Army Aviation, and by bringing together all the elements of Army Aviation materiel development, we will facilitate a better team effort to guarantee that success.

Looking for a better way

In closing, we are always interested in better ways of doing business and new Army Aviation projects. Our goal is to provide the user with the best performing, most affordable, and most easily maintainable equipment possible. We challenge industry and our government laboratories to bring forward new and innovative ideas.

I hope this in-depth explanation of our DAS functions helps the aviation community in understanding how AVSCOM operates in the RDT&E world after the reorganization. IIIII

RPV'S: ABOVE AND BEYOND THE BEST

BY COLONEL ROBERT S. FAIRWEATHER

WITH little fanfare, the small airplane crossed the **Forward Line of Troops (FLOT).** The troops below, both enemy and friendly, never heard or saw it. More importantly, the enemy's searching radars swept past it, thinking it to be a bird or extraneous clutter. Once beyond the first echelon regiments, the airplane turned to the north and established the first leg of its planned mission routing.

The air cavalry troop leader looked intently at the screen of the TV that had been remoted into the squadron **Tactical Operations Center (TOC).** His planned flight path as the lead element for the over-the-FLOT operation unfolded in front of him. He noted the small valley that would allow him to navigate **Nap of the Earth (NOE)** around an almost hidden **Air Defense Artillery (ADA)** gun site. Thanks to AQUILA, he would avoid blundering into that trap.

All that and more

Although long touted as an artillery system, the AQUILA has many dimensions on the battlefield. Sure, it will do a super job of accurately locating targets out to the full range of artillery. And there is no doubt that its ability to guide COPPERHEAD against tanks and other point targets will make it invaluable. But it can do much more. It can tell the maneuver commander where the enemy is, what he is doing, and how he is equipped. At the same time, it can assure the maneuver commander that his own troops are properly deployed to meet the attack.

For the intelligence community, the AQUILA can refine information from other sources by taking a first hand look at the area of interest. It can collect information on the terrain or weather, and can help determine the enemy's plan of maneuver. Someday, it will be able to carry payloads that can eavesdrop on the enemy's communications, or even degrade their effectiveness.

In support of aviation, the AQUILA can save lives, reduce losses to helicopters, laser designate for HELLFIRE, and help search for downed aircraft. Although it might appear to be a competitor to Army Aviation and may even cause some pilots to fear for their jobs, the AQUILA actually complements aviation on the battlefield.

It is the ideal system to place in high threat areas and can be used effectively to locate ADA sites and neutralize or destroy them with artillery. It can be teamed with air cavalry to reconnoiter forward and to the flanks, and can pick up where the sensors on the AHIP leave off to see over the next hill or to look in depth.

A total system

When most people think of AQUILA, they are actually thinking of the sleek, tiny air vehicle. However, it is much more. It is a total **Remotely Piloted Vehicle (RPV)** system architecture that is mostly composed of ground subsystems.

First, there is the heart and brains of the system — the ground control station with its associated data link antenna. The two "pilots" reside here, one controlling the automatic functions of the air vehicle, and the other the mission payloads (FLIR and TV). The data link sends line-of-sight commands to the air vehicle and receives the output of the TV or FLIR payload. In order for the main computer to keep track of the air vehicle location and determine the location of targets, the data link antenna measures azimuth,

Advancing RPV Technology

How to fly through

Tanks
Aquila reports their movements with real-time television pictures.

Ammo dumps
Aquila pinpoints the target and assesses damage.

Artillery
Aquila spots it and relays its position.

Wherever you'll find targets like these, you'll also find intense antiaircraft fire.

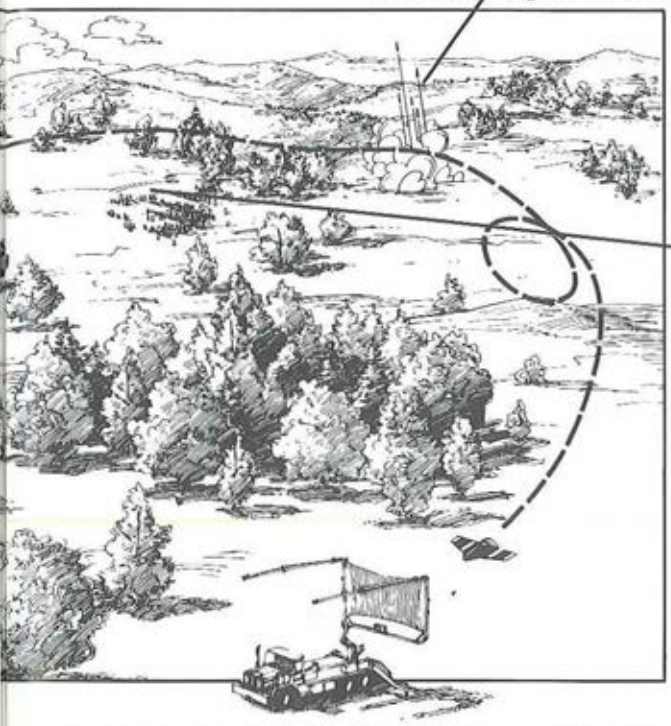
To locate the enemy, you could risk an expensive high-performance aircraft and its irreplaceable crew. Or you could send a small Army/Lockheed Aquila RPV to do the same job—at a fraction of the cost.

The affordable Aquila will give battle commanders better control of the battle. Interfacing with TACFIRE, it directs volleys with first-round accuracy. Its laser designator lights the way for laser-guided munitions. And it also will be able to serve as a radio relay for communications, a communications jammer, an ELINT collector, and a meteorological sensor. FLIR gives Aquila eyes to watch the enemy through the darkest night. And after each sortie it will return to its retrieval net, ready to be prepared for another mission.

While sending back real-time television

hell and back.

Rockets
Aquila finds them without becoming their victim.



Troops
Aquila locates them while evading their fire.

pictures and other information from hostile territory, Aquila will loiter, jink, and beeline at 110 mph. Its radar profile is but a speck, and its 13-foot wingspan makes it an almost impossible target for enemy gunners. Even infrared-seeking weapons are thrown off by Aquila's cool performance under fire. It has demonstrated its survivability against a deadly mix of weapons.

However hellish the battle zone, Aquila is the reconnaissance/target acquisition vehicle that can look down the enemy's throat—and return to fly another day.

Lockheed Aquila
Leadership in Technology

the air vehicle measures spatial orientation and altitude, and the payload measures range and direction to the target. It is a simple matter of precisely measured geometry. The data link between air and ground can, of course, operate in an anti-jam environment.

The air vehicle is launched from the rail of a truck-mounted hydraulic launcher and is caught at the end of its mission in a truck-mounted recovery net. A typical AQUILA battery has two launchers and recovery nets, five ground control stations, 13 air vehicles, a maintenance shelter, and sufficient vehicles to give the unit full ground mobility. The battery is organic to the Corps, but normally will be assigned to a Division for employment.

A mission profile

A normal mission would start with the AQUILA being launched in the division rear and then handed off to a forward located ground control station. Once it crosses the FLOT and arrives in the area of interest, the payload operator will scan for targets or to collect battle information. If a suitable target is found, it can be located to eight digit coordinate accuracy, and can be attacked with artillery or a precision guided munition. When finished with the mission, the AQUILA would be brought back across the FLOT by the forward control station and handed off to a station located in the rear. It then would be commanded to make a fully automated landing in the recovery net.

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ABOVE: This unmanned air vehicle is just one part of the Army's AQUILA Remotely Piloted Vehicle System which performs target acquisition and designation, aerial reconnaissance, and artillery adjustment missions.

In the tactical configuration, and with either a TV or FLIR payload, the air vehicle weighs approximately 275 pounds. It will normally cruise at between 130 and 150 km/hr and have an endurance of three hours. The 26 horsepower, two-cycle engine is mounted in a pusher propeller configuration and is relatively quiet. Further enhancing air vehicle survivability are its small size, its ability to accomplish jinking maneuvers, a small radar cross section, and a low infrared signature.

The airframe structure is fabricated from Kevlar in a delta-wing configuration, and has no conventional tail section. An onboard attitude reference assembly and a flight control electronics package "fly" the air vehicle, and navigation is provided by the ground control station.

Where we stand

The AQUILA system is currently in the contractor flight testing phase and most of the required capabilities have already been demonstrated. Government testing will take place in 1985 and, if all goes well, production will start in 1986. Once the AQUILA is fielded, the Army will have a revolutionary new capability that will realize the potential promised by the less sophisticated Israeli RPV systems during the 1982 war in Lebanon.

Meanwhile, Army Aviation officers should learn all they can about AQUILA so that they can fully exploit its capabilities to support aviation in future battles. IIIII

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AVSCOM'S GLOBAL ROLE

BY MR. DONALD PLATT

AVSCOM's mission, in the support of Army Aviation, is truly world-wide in scope when one considers AVSCOM's responsibilities in the support of aircraft for many foreign governments. This effort, as part of the U.S. Government's overall Security Assistance Program, is the immediate responsibility of the Directorate for International Logistics.

An evolving role

AVSCOM's role in Security Assistance has evolved from the transfer of aging fixed and rotary wing aircraft excess to the U.S. Army inventory, through the now defunct Grant Aid program, to the sale of modern, technologically sophisticated aircraft to customer nations throughout the world. Such venerable warbirds as the CH-34 CHOCTAW, the OH-13 SIOUX, the OH-23 RAVEN, the C-1 BIRD DOG, the U-1 OTTER, and the U-6 BEAVER have been supplemented by the UH-1 IROQUOIS, the AH-1 COBRA, and the CH-47 CHINOOK.

In fact, over 1,000 UH-1 aircraft are currently in service in foreign countries, including those manufactured under co-production agreements with the Federal Republic of Germany and Taiwan. Over 3,500 aircraft of all kinds have been provided to customer nations through the AVSCOM Security Assistance Program under the Directorate for International Logistics.

A major landmark in the expansion and development of the AVSCOM's role in Security Assistance occurred in 1972, with the onset of the Iranian Army Aviation Program. This program began with the sale of the Bell 214A helicopter, an aircraft basically derived from the UH-1 but with a version of the T-55 engine installed. The aircraft was designed to accommodate the severe hot day/altitude environment in Iran.

The 214A program, which included aircraft design, development, U.S. Army Airworthiness Qualification Testing, and production, resulted in the formation of the Iran Aircraft Program Project Manager's Office at AVSCOM with full responsibility for this undertaking. A total of 332 214A aircraft were ultimately provided under the auspicies of the program. Additionally, AVSCOM assumed responsibility for the procurement of 202 AH-1J COBRA helicopters sold to Iran under a U.S. Navy **Foreign Military Sales (FMS)** Case.

In 1974, the AVSCOM Security Assistance mission in support of Iran expanded with Iran's approval of additional FMS cases for the development of complete in-country facilities for helicopter logistics support and and training of pilots and maintenance personnel. This ambitious effort, for which AVSCOM contracted with **Bell Helicopter International (BHI)**, was in essence a program to create in Iran an aviation organization able to accomplish missions similar to those of AVSCOM, Corpus Christi Army Depot, and the Aviation Center at Ft. Rucker, AL.

This effort, which terminated with the Iranian Revolution, resulted in AVSCOM contracts with BHI in excess of $800 million. Over the course of the Iranian Army Aviation Program, AVSCOM was responsible for approximately $2 billion in FMS Cases.

Assistance highlights

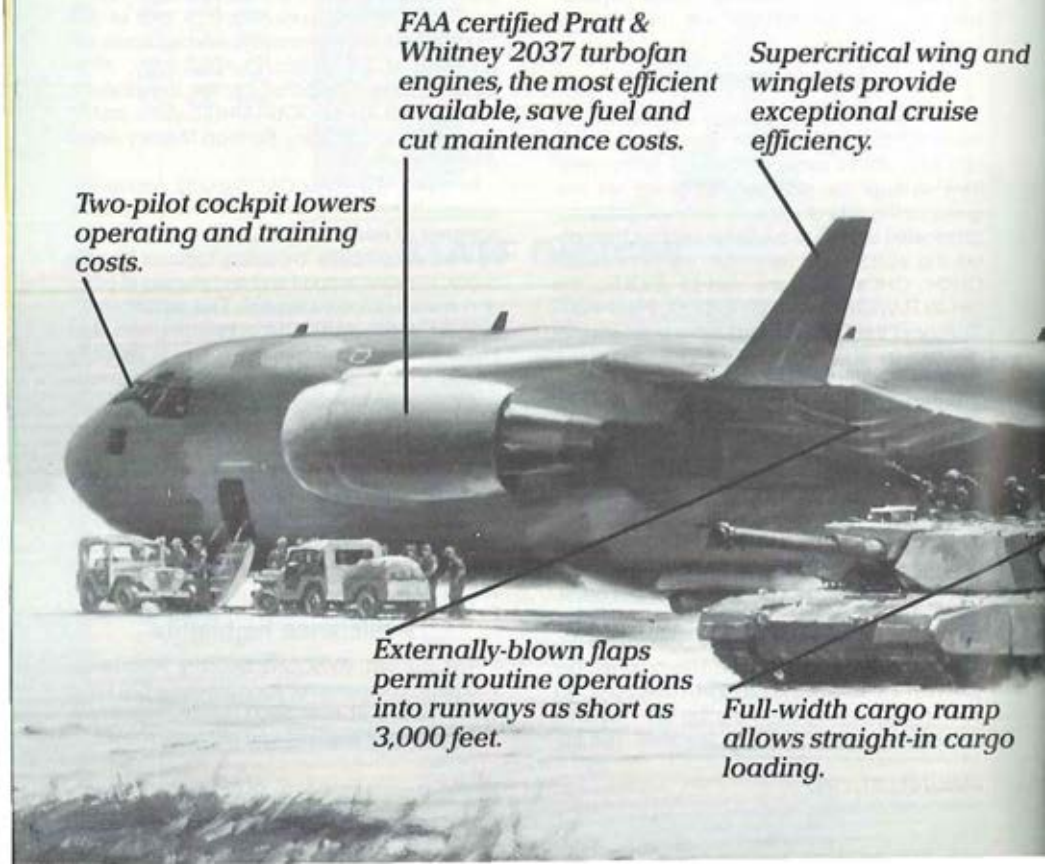
The current AVSCOM Security Assistance Program, composed of approximately 170 open cases valued at over $500 million, includes a wide variety of materiel and services with forth-

SOLUTION: THE C-17.

The C-17 will airlift troops and cargo from the U.S. directly into forward areas where only short runways and limited ramp space are available. It will bypass major airfields and ports where cargo frequently stacks up waiting for forward shipment to the combat zone. This direct delivery will give the theater commander far more flexibility to counter the threat.

The C-17's supercritical wing design and propulsive lift system make direct delivery possible. Engine exhaust blows on the wing flaps to increase wing lift. The result is a much steeper angle of approach to the airfield, a lower landing speed, and routine operations to 3,000 foot runways.

THE AIRLIFTER THAT BRINGS THE



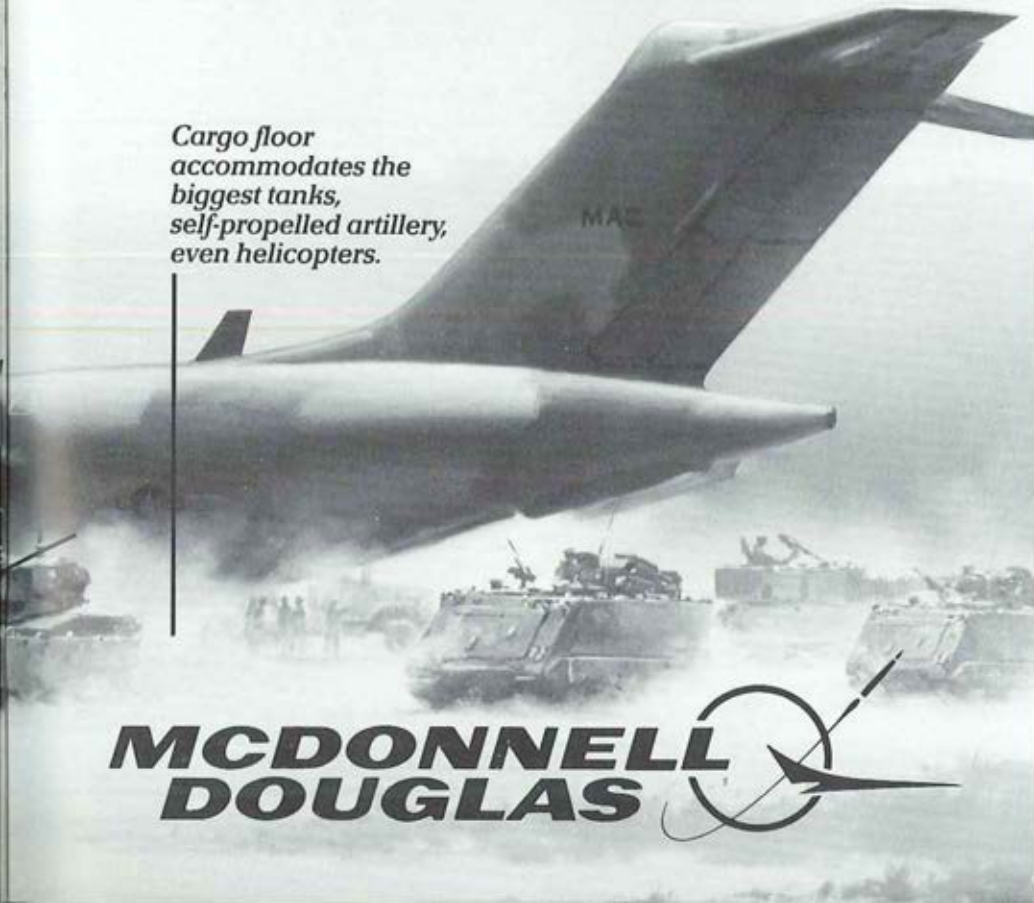
The C-17 will carry all current and proposed U.S. Army and Marine Corps combat equipment. And it's the only airlifter which can airdrop outsize equipment.

There's more to an airlift mission than payload and speed.

On the ground, the C-17 can be turned around in just 90 feet. It can back up. It can offload pallets while taxiing and be fully unloaded with engines running without disrupting ground operations.

The bottom line: The sustained, routine movement of the cargo we need to exactly where it's needed in less time than ever before.

MISSION DOWN TO EARTH.



Cargo floor accommodates the biggest tanks, self-propelled artillery, even helicopters.

MCDONNELL DOUGLAS

coming deliveries of the UH-1H, AH-1S, the Hughes 300, and Hughes 500. Descriptions of several significant on-going programs follow.

● **Turkey** — The Turkish aviation program reflects a major undertaking involving both the delivery of new aircraft and the upgrading of aircraft maintenance and logistics support capabilities. This effort began with the decision in 1981 to procure new production UH-1H helicopters for both the Turkish Land Forces and Air Force. This decision resulted in the reopening of the UH-1H production line at Bell Helicopter. The last UH-1H for the U.S. Army was delivered in 1976 and the last UH-1H production for Security Assistance was in 1979.

Subsequent to Turkey's go-ahead for the UH-1Hs in early 1982, and as a result of the efforts of the US-Turkish Defense Industrial Cooperation organization, the decision was made to initiate an in-country co-assembly program for the Land Forces aircraft. Thus, not only would new aircraft be brought into the inventory, but the additional equipment and training required for the co-assembly would also greatly enhance the overall aircraft maintenance capabilities.

Under the co-assembly program, Plan A, in-country efforts will include re-assembly of main rotor and tail rotor hubs and blade assemblies, assembly of 42°/90° gearboxes and transmission, engine buildup, gearbox green run, tailboom assembly, and final assembly including paint. This effort is now underway with the first co-assembly aircraft in production in-country.

A follow-on co-assembly effort for additional aircraft is also underway with deliveries to commence in 1985. This effort, Plan B, will increase the in-country effort by adding the assembly of cargo and crew doors, tailboom structure, and primary and cabin fuselage splice, and transmission green run.

Additional aircraft for Plan B type co-assembly are anticipated, as well as future requirements for observation and attack helicopters.

● **Pakistan and Jordan** — AVSCOM's largest Security Assistance Programs, at present, involve the sale of the AH-1S COBRA to the Governments of Pakistan and Jordan. Aircraft deliveries for these programs is expected to begin early this year, and the combined value of these programs exceeds $300 million. Because of the complex nature of the AH-1S COBRA, the successful accomplishment of these programs requires an intensive, coordinated effort by many diverse parties.

Two major obstacles confront the introduction of a complex weapons system into a foreign country. First, the facilities and personnel available are unlikely to equal what one would find in a similar U.S. Army unit. Second, and more importantly, the logistics support pipeline is infinitely more complex.

The development and implementation of a successful weapons system introduction is best managed by the **Total Package Approach (TPA)**. Careful, timely review of the essential elements of the TPA helps insure successful aircraft deployment, operation, and maintenance.

Management of the Pakistan and Jordan programs under TPA has been enhanced through the use of two devices. The first of these devices is the Security Assistance **Program Requirements Determination Team (PRDT)**. The PRDT conducts in-depth analyses of the customer country's existing capabilities and requirements,

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and provides recommendations on necessary preparations by the customer in anticipation of aircraft delivery and usage.

The analyses can best be accomplished prior to the preparation of a major FMS case, or at least in the very early stages of case implementation. The recommendations will include such topics as spare and repair parts, support and maintenance equipment, and specialized personnel necessary to operate and maintain the aircraft.

A typical PRDT is chaired by AVSCOM's Director of International Logistics with its membership drawn from prime contractors, appropriate in-country U.S. military advisors, other AMC major subordinate and commodity commands, other directorates within AVSCOM, and from **U.S. Army Security Assistance Center (USASAC)** personnel. Over a two week time frame, the PRDT will develop, in close coordination with the customer country, a complete program of support tailored to the country's resources, capabilities, and goals.

An important tool

The other prime device is the **Program Management Review (PMR)**. During PMRs, program requirements and milestones are reviewed, achievements are noted, problems defined, and corrective actions determined. Most importantly, critical action items are identified and milestones for their completion are established. Representatives from the same agencies involved in PRDTs are included in PMRs.

These face-to-face management reviews, held on a regular basis, are initially conducted in St. Louis. As deliveries of aircraft occur, the meeting location is shifted to the customer nation, where actual day-to-day problems are experienced, and where diagnoses and corrective actions can be quickly discerned and applied.

The value of such devices as the PRDT and the PMR can not be overestimated. These face-to-face encounters have proven to be the best means available to insure accomplishment of program milestones. Moreover, these reviews foster a sense of common purpose, camaraderie, and professional dedication between the U.S. and foreign participants. The Pakistan and Jordan programs are sterling examples of the high level of achievement possible when such devices are properly employed and utilized.

• **Kenya** — The Kenya Army Helicopter Program has been ahighly successful and unique effort. In 1978, Kenya Army Aviation did not even exist and all aviation activities were restricted to the Kenyan Air Force. With the decision in 1979 to procure the Hughes 500MD and 500MD/TOW aircraft, Kenya Army Aviation was born and in the past five years it has grown to manhood.

This program has presented a unique challenge to both the U.S. Army and the Kenyans because it is an FMS transaction involving an aircraft nonstandard to the U.S. Army and because no prior aviation experience existed in the Kenyan Army. Moreover, this effort also represented the first U.S. Army Security Assistance Program in Kenya.

Initially, a contingent of **Hughes Helicopter, Inc. (HHI)** personnel conducted all basic flight training, maintenance training, and all logistics and technical assistance. Additionally, this effort has been supported by an in-country AVSCOM "field office," a U.S. Army **Mobile Training Team (MTT)** for tactics training, and a **U.S. Army Technical Assistance Field Team (USATAFT)** for continued advice and assistance.

As a result of both the in-country training, and the Kenyans use of U.S. Army CONUS training through the **International Military Education and Training (IMET)** program, the program has matured to the point where all flight training is conducted by Kenyan Instructor Pilots and aircraft maintenance is being accomplished by Kenyan personnel with minimal contractor technical assistance. The growth of the Kenyan Army Aviation program from zero to full operational status within a short five years is a significant accomplishment for all parties involved.

A wide horizon

AVSCOM has taken an active role in Security Assistance Aviation Programs throughout the world. Extraordinary efforts both at AVSCOM and Corpus Christi Army Depot have resulted in the timely delivery and support of aircraft to Central America.

Many other Security Assistance Programs loom on the horizon and the dedicated, knowledgeable professionals of AVSCOM's Directorate for Internal Logistics stand ready to give full support to the aviation needs of our customer nations throughout the world. IIIII

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THE DIRECTORATE FOR MAINTENANCE

BY COLONEL DANIEL J. RUBERY

THE Aviation Systems Command's Directorate for Maintenance serves as the **National Maintenance Point (NMP)** for Army Aviation systems and is responsible for insuring that these systems are initally provisioned, maintained, and modernized.

Viewed from the perspective of the aviation crewman or maintenance personnel, the NMP is the place where they find new materiel introduction teams, technical publications, depot maintenance, modification field teams, maintenance engineering, and maintenance data management such as equipment improvement reports (6,000 annually), DA Form 2410 Component Records, as well as information on general aviation maintenance policy and procedures.

Life cycle management

Through these programs the Directorate for Maintenance (a military and civilian team organized into four major functional divisions) provides life cycle management for 13 major aircraft systems. Not only do these organizations respond to the field, but they are also the supporting structure for those developing systems fielded by program managers.

The Director of Maintenance is the Aviation Program Manager for the P7M wholesale maintenance program. In plain language, this is the organization that pulls together the financial plans for future depot maintenance programs, modification applications, sustaining engineering, sample data collection, maintenance publications, materiel introduction, the logistics assistance program, and maintenance engineering. In FY '85 alone, this program is funded in excess of $625 million and it requires a group of dedicated personnel to justify and defend these critical readiness oriented programs.

The aviation depot maintenance program is funded at $475 million and consumes 29%of the total annual appropriation for Army depot maintenance. These dollars not only insure the overhaul of 375 aircraft, 1,500 engines and 19,000 components annually, but also provide the funding for dispatching depot teams for on-site repair. The worldwide network of modification sites, which apply over 6,600 modification work order kits annually, is financed and managed from the NMP.

The National Maintenance Contracts program is another major element of the depot maintenance program. In FY '85 more than 1,200 seperate repair programs were contracted in the commercial sector. This effort was valued at $80 million.

The maintenance engineering element of the NMP is engaged in developing the Progressive Phase Maintenance Concept, the Aircraft Battle Damage Repair Program, and maintenance engineering management. Depot maintenance support planning is a major task requiring detailed plans to identify tooling, equipment, and test, measurement, and diagnostic equipment needed to perform depot maintenance, and integrate the necessary ingredients to achieve a capability to support fielded systems. Depot capability for systems flown and maintained occurs only after many years of planning and budgeting.

Flight safety

The **Safety of Flight (SOF)** Program is managed by an SOF group located in the NMP engineering organization. This responsibility requires a dedicated group of professionals who can quickly assemble a team of technical and

logistical experts to address perceived or validated SOF conditions and provide the aviation community with a way to identify both the problem and the appropriate corrective action. This same element must also ensure that every affected aircraft has the required action applied.

Another small, dedicated group of aviation professionals is found laboring at a task that everyone takes for granted and assumes will be done. These men and women are known as the provisioning or tech data people. Their efforts initially establish a provisioning master data record which leads to establishing a national stock number enabling the equipment user to requisition a part.

Not only do they establish a record for every bit and piece found on an aircraft (there are 41,000 airframe related items on an AH-64), but they also provide the coding that identifies source and level of repair, essentiality codes for generating combat **prescribed load list/authorized stockage list (PLL/ASL)**, Support List Allowance Card decks, and a multitude of other codes which are essential to the National Inventory Control Point, procurement activities, and program managers. This coding is also essential to create and publish the repair parts and special tool listings that are used every day a hundred times over.

Maintenance manuals

Those maintenance manuals — yes, they also come from the NMP. They are printed by the Adjutant General's Office, but the writing, editing, illustrating, and research are done under the direction of the NMP. AVSCOM manages over 1,500 publications and publishes over 32,000 pages a year. The NMP is the focal point not only for updating the technical pubs, but also for developing and validating those arriving with force modernized systems. The 6,000 DA Form 2028's received annually help to keep this element on its toes.

Remember the new equipment training teams? They are alive and well in the NMP. The manner in which training is conducted during the introduction of new systems has changed so you don't see as many teams in the field. What you saw was only the culmination of many years of effort and that continues today.

The materiel introduction team is still responsible for scoping pilot and maintenance training requirements, contracting for development of **Programs of Instruction (POI)** — including training devices — and validating the entire package before passing it on to the appropriate TRADOC school for implementation. This goes on for years prior to actual fielding and requires visionary managers to insure that state-of-the-art technology is captured.

Logistics assistance

Any narrative depicting the NMP would be incomplete if it didn't address the logistics assistance program. Today we call them **logistic assistance representatives (LAR)** instead of field maintenance technicians, but they remain the same dedicated professional technicians working the flight lines from Tongduchon, Korea, to Nelligen, Germany.

This small band of talented civilians is the wholesale community's daily contact with the users of our equipment. The LAR's are there to answer those questions not found in the technical publications and to instruct our crews, both maintenance and flight line, on how to take care of their assigned equipment.

With force modernization, the Army's equipment has tremendous capabilities, but it has also become very technically sophisticated. Maintainence is a challenge for all involved. To meet this challenge, AVSCOM developed a concept called the Systems Integrated Support Specialist. This individual is trained to troubleshoot and identify repair procedures, to include fault isolation down to the control card level.

Once a problem is identified, it is referred to the responsible wholesale command LAR. This one-step approach to identifying problems is a time saver for all involved and greatly enhances the effectiveness of the entire LAR community.

The NMP mission covers many facets of the life cycle process and impacts almost every aspect of the logistic community's efforts to maintain its equipment. NMP efforts are not always glamorous, nor are they always visible, but they are an essential key to readiness.

The aviation community has our commitment that we will always strive to provide the highest quality support. IIIII

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COL DANIEL J. RUBERY CURRENTLY SERVES AS THE DIRECTOR FOR MAINTENANCE AT THE U.S. ARMY AVIATION SYSTEMS COMMAND.

COBRA: EVOLUTION OF THE ATTACK HELICOPTER

BY MAJOR RUDOLPH T. SCHWAB

FROM a modest and controversial beginning, the attack helicopter has taken its place as a prestigious member of the combined arms team. In 1961, **GEN Hamilton Howze** chaired the Army Tactical Mobility Review Board from which emerged the present concept of the armed helicopter and the birth of the COBRA.

The past

A total of 1,126 Vietnam model AH-1G's were produced from 1966 to 1973. With the end of US involvement in Vietnam, Army planning returned to the primary mission of fighting a mid-intensity war in central Europe, and our doctrine and equipment changed accordingly. The COBRA team met this challenge by incorporating the combat proven TOW missile system on the helicopter to make it an effective tank killer at ranges up to 3,000 meters initially and 3,750 meters presently.

The first AH-1G's configured with the Airborne TOW Missile System (M-65) were designated AH-1Q. To compensate for the degraded aircraft performance, as a result of M-65 weight, an upgraded engine and transmission was installed and the aircraft was then redesignated as the AH-1S (MOD).

During the 1970's the improvements continued. Though proper execution of **Product Improvement Proposals (PIP's)** current technology was incorporated into an existing airframe, providing added capability and survivability at relatively low cost.

The present

In 1975, the Army conducted a review in order to determine what changes would make the COBRA more effective on an armor intensive battlefield. The eventual result was the world's most advanced, most cost effective helicopter weapons system — The Modernized COBRA.

Canopy — The Modernized COBRA features a new, semi-flat surface canopy that is optimized for low light reflectivity and improved pilot head room. A ballistic jettison system is designed to explosively cut the acrylic side windows from the canopy in the event emergency egress is required.

Improved Main Rotor Blade (IMRB) — The IMRB was developed by Kaman Aerospace Corporation and is constructed from high technology composites utilizing a total composite design which increases blade life to 10,000 flight hours and requires less maintenance. The IMRB provides increased aerodynamics efficiency with a 3 to 5% lift improvement due to its nonsymmetrical airfoil surface.

The IMRB can withstand a single 12.7mm round and has a 30 minute flight capability for damage from 23mm high explosive rounds. The use of an efficient composite design has reduced rotor system radar signature and acoustic noise thereby improving aircraft survivability. The IMRB represents a significant improvement to the COBRA's safety, survivability and overall flight performance.

Universal Turret (UT) — The UT was developed by General Electric Armament Systems as a replacement for the M-28 mini-gun/grenade launcher turret. Design of the UT enables it to accept a 20mm or 30mm weapon. The COBRA utilizes the GE M-197 20mm cannon in conjunction with two sighting systems, the Helmet Sight System and the Telescopic Sight Unit.

Fire Control Computer (FCC) — The FCC is

Omega VLF

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Navigate by Lat/Long or UTM anytime, anywhere in the world. Night vision goggle compatibility with Litton Omega/VLF navigation systems give helicopter pilots the additional safety of accurate navigation in the dark-of-night as well as in daylight. The Omega Control and Display Unit (CDU), offering automatic synchronization and continuous display information, as viewed through night vision goggles is bright and clear—providing worldwide operational capability with less than 2-miles of bounded/error.

The Litton LTN-211 and LTN-3100 Omega/VLF Systems provide long-term, non-radiating accuracy at low-air speeds and low altitudes with an accompanying low cost-of-ownership, low weight and low volume.

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ABOVE: The HU-1 "WARRIOR" (shown in a 1962 photo on the left) was an early link in the evolutionary chain leading to the development of today's AH-1S Modernized COBRA (shown at the right).

the heart of the fire control system. It receives data from the Air Data System, Laser Range Finder, Rocket Management System, Head Up Display, and Doppler. The computer provides continuous ballistic solutions for 20mm and rocket firing, which results in improved first round hit probability.

Air Data System (ADS) — The ADS provides three axis airspeed, rotor down wash, static pressure and outside air temperature to the fire control computer. The real time conditions are then used to establish aim point corrections for COBRA weapon systems. This compensation and the basic ballistics equations of the weapons themselves provide a first round hit capability for the Modernized COBRA Aircraft.

Telescopic Sight Unit (TSU) — The primary use for the TSU is for employment of the Tow missile. The Laser Rangefinder located in the unit uses a series of light pulses to accurately identify target range for the fire control computer. The computer aligns the weapons system based on TSU sight information, airspeed, temperature and laser distance to make accurate target strikes.

Airborne Laser Tracker (ALT) — The ALT allows ground designated targets to be located and tracked from the air. The target area is indicated by coded pulses reflected from the target. The laser tracker aligns the TSU to the target location along the reflected light path which is received through the laser tracker sensor. This allows the gunner to sight in the designated target for weapons deployment. The increase in target acquisition capability greatly improves the COBRAs anti-armor effectiveness.

Head UP Display (HUD) — The HUD provides the pilot with targeting, weapons, and flight information. This design allows heads up continuous monitoring of vital subsystem functions enhancing pilot and weapon system performance.

TOW Missile System (TMS) — The TMS provides the COBRA aircraft with anti-armor firepower out to 3,750 meters or 2.3 miles. When fired, the TOW missile automatically follows the gunners line of sight to the target. The gunner need only maintain target tracking to score a hit. The accuracy and range of the TOW system provides the COBRA with a stand-off weapons capability beyond the range of many enemy air defense systems and is the primary weapons system on the Modernized COBRA.

Rocket Management System (RMS) — The RMS is used to preselect and fire 2.75 inch rockets. The RMS provides the pilot with the capability to select type, quantity and sequence of rockets to be fired. The RMS system also provides a remote fuze setting capability, enhancing rocket effectiveness against targets either in the open or under tree cover.

Survivability Equipment — The AH-1S is equipped with a hot metal plus plume suppressor. This design uses large volumes of ambient air to cool exposed metal surfaces and exhaust gases to lower plume temperatures. In addition, the COBRA is equipped with the ALQ-144 IR Jammer, which is an active IR counter measure unit that confuses IR seeking missiles. The AN/

ABOUT THE AUTHOR
MAJ RUDOLPH T. SCHWAB, A FORMER AEROSPACE ENGINEER WITH THE COBRA PMO, IS NOW AN ASS'T SECRETARY OF THE GENERAL STAFF, USA AVSCOM.

APR-39 radar warning receiver provides the pilot an audio and visual warning that he is being "painted" by enemy radar.

The future

The COBRA evolution continues. In order to improve the reliability, availability, maintainability and dependability of the aircraft, a **COBRA Fleet Life Extension Program (C-FLEX)** has been developed which consists of the following programs:

- **Main Rotor** — Provides an improved main rotor hub and pitch control linkage for increased reliability and safety. The main rotor hub features elastomeric feather bearing and a new steel pitch change tube. An estimated service life of 2,000 hours is anticipated versus the present 200-300 hour finite life.
- **AH-1G Upgrade (Minuteman)** — Modify the remaining 87 AH-1G aircraft to AH-1S (Mod) configuration, thus providing the capability to fire the TOW.
- **TOW Reliability Improvements** — Improves TOW system reliability 10 to 15%, by incorporating changes to the most critical high failure rate and replacement components, thus reducing the **partially mission capable (PMC)** rate attributed to the M65 TOW Missile System.
- **TOW System Test Set (TSGMS)** — Upgrades the current TSGMS by replacing the analog monitor control unit with an automatic digital controller. The new controller will reduce the complexity and operator skill level requirement through simplified procedures and reduces M65 test time from eight hours to less than one hour.
- **Radio Upgrade** — Replaces old obsolete communication and navigation radios with new versions, ARC-186, ARC-164C, SINCGARS, APX-100, and ARN-89B. This program will standardize radios throughout the fleet, while reducing the required logistical support from 12 types of radios down to five.
- **K-FLEX Drive Shaft** — Replaces existing short shaft with a new nonlubricated, more reliable and maintainable shaft. Service life is projected at 2,500 hours as opposed to the present 314 hours.
- **Nite Fix** — Due to the need to navigate at night and because the AN/AVS-6 night vision goggles intensify red light, the cockpit lighting must be changed to eliminate the present red lighting and incorporate blue/green lighting. The lighting will provide sufficient illumination to operate the aircraft at night with or without goggles.

The kit will consist of blue/green post lights, floodlights, instrument bezels and filter covers for caution panels. Blue/green position lights will be added adjacent to existing position lights, the existing searchlight will be modified with an IR cover, and a white light (landing light) will be mounted to the left forward skid cross tube.

Night target acquistion

However, for the COBRA to be completely effective on tomorrow's battlefield it must not only be able to navigate at night, but also detect and engage armor targets. As a result, the COBRA Project Manager initiated an R&D effort, designated C-NITE, to develop an inexpensive **Forward Looking Infrared (FLIR)** sight capable of detecting and recognizing targets and tracking the TOW 2 missile.

The PM emphasized the need for expedited development and low cost (deliveries are expected in 1986). Therefore, off-the-shelf production FLIR systems and TOW trackers were identified and the M1 Abrams Tank FLIR and the Bradley **Video Thermal Tracker (VTT)** were selected.

The C-NITE program modifies the existing M-65 Airborne Tow System by integrating FLIR common modules and the VTT into the Telescopic Sight Unit and adding three Line Replaceable Units: the **FLIR Missile Tracker (FMT)**, the **FLIR Power Supply (FPS)**, and the **FLIR Control Panel (FCP)**.

The FMT and FPS are installed in the tailboom with the FCP attached to the underside of the gunner's glare shield. Since the M-65 primarily provides an operational capability from dawn to dusk, the C-NITE program expands this envelope by providing a target detection/recognition capability at night and during battlefield obscuration. Inclusion of the VTT provides the capability to track TOW 2 missiles through smoke and Electro-Optical Countermeasures.

By combining sound material acquisition techniques with today's technology on a proven helicopter through the Modernized COBRA program, the Army is continuing to meet its attack helicopter requirements in a rapid and low cost manner. IIIII

OH-58D: THE LATEST NEWS

BY COLONEL WILLIAM H. FORSTER

THE September, 1984, issue of **Army Aviation** was devoted principally to the OH-58D (AHIP) and included several articles from various members of the AHIP team. If you have not had the opportunity to read that issue, I encourage you to dig it out of your magazine rack or desk drawer and take a look. However, I assume that most of you are loyal readers of our AAAA journal, so I won't repeat the contents of those articles here. Rather, I'll give you a brief summary of current and upcoming events of interest.

Ongoing test programs

Government Development Testing (DT) was conducted at Yuma Proving Ground, AZ, during last July and August by the **Aviation Development Test Activity (ADTA),** the Electronic Proving Ground, and Yuma Proving Ground, and was completed on schedule. This test program was a detailed technical evaluation of the aircraft, mast mounted sight, and subsystems to ensure specification compliance.

The test team put in many long grueling hours, seven days a week, and are to be commended for their dedication and professionalism. Their efforts resulted in 300 test hours in two months and produced test data which is being used to confirm the production design and to help identify changes to correct shortcomings which were noted.

On 28 August 1984 a production HELLFIRE missile was launched from an AH-64 and successfully hit a target tank which was being designated by the OH-58D laser. This marked the first time these three major systems (AH-64, OH-58D, and HELLFIRE) have been put together as an integrated combat team.

After successful completion of DT, three prototype aircraft were delivered on 1 September 1984 to FT. Hunter-Liggett, CA, to begin **Operational Testing (OT II).** The first few days were devoted to completing installation of test instrumentation and insuring aircraft were ready for OT training. As the aircraft were turned over to the OT unit (B Troop 2/17th Cavalry, 101st Air Assault), individual crew training began which progressed to collective training of the scout/attack team. Concurrently, the other units which made up the Red and Blue forces (both ground and air) were conducting training and being outfitted with test instrumentation.

The whole picture

The OH-58D will be evaluated in the Field Artillery Aerial Observer role as well as in the scout role with the AH-64. In addition to the contribution to combat effectiveness which the OH-58D gives the field artillery and attack helicopters, its maintainability and reliability are also being evaluated. The soldiers of B Troop 2/17th Cav are responsible for the AVUM level maintenance, and members of the 5th Transportation Battalion, 101st Air Assult, are providing AVIM level support. Depot level efforts are the responsibility of the contractor during the test.

OT II testing will continue through January, 1985, and will culminate with live fire tests using AH-64 launched HELLFIRE missiles and cannon fired COPPERHEAD artillery rounds. The extensive nature of the OT is best exemplified by the number of flight hours involved — over 600; the time — five months; and the number of personnel required to support the total test effort — over 900!

(OH-58D News — Continued on Page 58)

OH-58D:

The new Bell Aeroscout came through basic training with flying colors. And in combat, it is a standout.

Which is precisely why the U.S. Army pilots who have trained on the Bell OH-58D are so excited. With its simple control display systems, the Aeroscout practically flies itself. So the crew can focus their attention more deliberately on the mission at hand. And that's where the OH-58D really stands out. Because it stands off.

The Aeroscout's Extended Range Standoff has exceeded everyone's expectations. Even Bell's. The precision of its Target Acquisition System (highly stabilized TV and infrared sensors coupled with a rangefinder/designator of unparalleled accuracy) will endow the Army with a stealthy, multi-mission aircraft of incredible performance and enviable survivability.

As the Bell OH-58D embarks upon its formal, documented training with the Army, one thing is clear as a Bell: the best way to stand out, is to stand off.

Bell Helicopter TEXTRON

The future is ours by design.

CH-47D UPDATE

BY COLONEL NORBERT I. PATLA

IT is indeed a pleasure to be able to update the Army Aviation community again, and to report on the progress made by members of the CH-47D program management team in the achievement of three major milestones in our modernization program.

These milestones include the completion of the second **Initial Operating Capability (IOC)** unit; Congressional approval to pursue a 5-year, multi-year procurement package; and the introduction of a lead-the-fleet preventive maintenance program.

As most of you know, IOC was achieved in February, 1984, when the 24th Delta model CHINOOK was delivered to the 159th Assault Support Battalion, 101st Airborne Division (Air Assault) at Ft. Campbell, KY. I am pleased to have this opportunity to report that our second unit, also located at Ft. Campbell, achieved IOC in October, 1984, and that team efforts continue as we start on the third unit.

In FY '85 we will focus our attention on the fourth and fifth units located at Hunter Army Airfield, Savannah, GA, and at Ft. Bragg, NC.

The Army's plan to modernize 436 A, B, and C model Chinooks to the "D" configuration is on track with a total of 88 aircraft under contract and 45 delivered to date by Boeing Vertol within budget and on schedule. Having received FY '85 Congressional authorization to pursue a 5-year multiyear, we are presently evaluating an FY '85-89 **Multiyear Procurement (MYP)** proposal for the modernization of 240 aircraft at 48 per year.

This MYP will enhance the stability of this program, as well as the medium lift fleet, and provide significant cost avoidance over a series of single year contracts. It currently has the full support of the Congress and DOD and we are presently anticipating a second quarter FY '85 contract award.

The CH-47D will extend the life of the Army's medium lift helicopter fleet beyond the year 2,000 while providing a 52% increase in lift capability, a 27% decrease in operating and support costs, and improved fleet compatibility, reliability, availability, maintainability, and safety. The improvements in the D model are brought about by the installation of several new components and systems that incorporate state-of-the-art technology and materials into the aircraft. Listed below are a few examples of the D model improvements:

- A redundant hydraulic system which utilizes highly reliable modular components to reduce the number of hoses, tubes, and fittings. This feature eliminated approximately 700 potential leak points and is a major contributor toward the reduction of maintenance in the field.
- Fiberglass rotor blades offering increased performance, reduced maintenance, and enhanced safety features when compared to metal blades. They also increase survivability by being ballistically tolerant to 23mm projectiles.
- An **Advanced Flight Control System (AFCS)** which offers improved flight handling characteristics over the current CH-47 by providing greater short-term damping, long-term trim hold, and improved IFR capability. The AFCS stabilizes the helicopter about the pitch, roll and yaw axes, automatically maintaining desired heading, airspeed, and altitude.
- A triple cargo hook system which provides increased battlefield flexibility and capability. The fore and aft hook capacities are 17,000 pounds each while the center hook is rated at

26,000 pounds. The multihook system permits movement of outsized external cargo at speeds in excess of 115 knots, compared to the present limit of 40 to 60 knots and allows drop-offs at three locations on a single mission.

The CH-47 Modernization Program is now in its 4th year of production and, including RDT&E contracts, its 8th year of contract performance. Production aircraft deliveries began in May, 1982, and totaled 45 through the end of October, 1984. The current production rate of 3 per month will build to a maximum of 4 per month by April, 1985.

The CH-47D continues to perform well in the hands of the user. The aircraft of the first two units at Ft. Campbell have compiled more than 6,300 flight hours and achieved a cumulative mission capable rate of 76% compared to the DA standard of 70% for its medium lift helicopter fleet. We fully expect the operational readiness rate to increase as a result of our recent change from the old phased maintenance plan to a new **Progressive Preventive Maintenance (PPM)** system which is patterned after the system used by the airline industry.

This innovative concept takes full advantage of the high reliability of the aircraft, and places it under more manageable and correctly structured inspection intervals. The PPM is a series of 10-hour inspections that more efficiently covers the inspection requirements of the aircraft than did the old phase and daily maintenance inspections by eliminating both duplicative and unnecessary requirements. Watch for this new maintenance concept to take hold Army-wide.

Continuing success

The modernized CHINOOK, with its increased readiness, effectiveness, and supportability, will greatly increase the medium lift capability of the Army's air assault division while reducing both its maintenance workload and operating and support costs. The continued success of the CH-47D provides proof that a dedicated Army/industry team can develop, produce, and sustain an effective weapon system within cost and on schedule. IIIII

ABOUT THE AUTHOR
COL NORBERT I. PATLA CURRENTLY SERVES AS THE AVIATION SYSTEM COMMAND'S PROJECT MANAGER FOR THE CH-47D MODERNIZATION PROGRAM.

OH-58D: Latest News

(Continued from Page 55)

An HQDA In-Process Review of the program was held on 6 September 1984. The review was a thorough discussion of all aspects of the program with emphasis on emerging DT results and actions to be taken to correct deficiencies revealed in testing. Based on this review, HQDA approved initiation of the **Low Rate Initial Production (LRIP)** of 16 OH-58D's. A firm fixed price contract for the 16 aircraft, initial spares, training devices and courses and system peculiar ground support equipment was awarded to Bell Helicopter Textron on 29 September 1984. First delivery of a production OH-58D is scheduled for November, 1985, and fielding to the IOC unit will begin in early 1986.

A team effort

Award of the LRIP contract is a significant milestone and represents the successful efforts of the entire AHIP team to accelerate the acquisition process while working to reduce the risks of concurrent development, test, and low rate production. This could not have been accomplished without the whole-hearted support and best efforts of the entire team — AVSCOM, MICOM, NVEOL, the logistics community, TECOM and the test community, the TSM and the user community, and the contractors.

The AHIP has been a team effort and it will remain a team effort as we now focus our efforts on production, fielding, and support. IIIII

ABOUT THE AUTHOR
COL WILLIAM H. FORSTER CURRENTLY SERVES AS THE AVSCOM PROJECT MANAGER FOR ADVANCED SCOUT HELICOPTERS.

IMIP CREATES A FACTORY OF THE FUTURE

BY MR. JAMES R. CORWIN

THE primary mission of AVSCOM's Directorate for Procurement and Production is to contract for aircraft systems and their support as well as for the research and development of aviation materiel to meet the Army's present and future requirements. The directorate is involved at all levels of the Army Aviation acquisition cycle.

The directorate buys for the oldest aircraft in the system as well as for the aircraft just off the drawing board. From nuts and bolts to microchips and aviation repair parts, AVSCOM can't have it unless P & P gets involved.

The P & P Directorate converts requirements generated by users into contracts for major aviation weapon systems, aviation related spare parts, maintenance services, aviation related studies — whatever AVSCOM needs to maintain combat readiness of the Army Aviation fleet.

Once these contracts are awarded, the P & P Directorate is responsible for their administration, insuring that purchases are delivered on time and in the right quantity and quality.

The directorate also makes purchases to support Foreign Military Sales cases and Army National Guard and Army Reserve units.

The look of the future

One of P & P's latest ventures involves the DOD **Industrial Modernization Improvement Program (IMIP)**. Funded with **Manufacturing Technology (MAN TECH)** Program money, this joint AVSCOM-AVCO Lycoming undertaking is upgrading the **Stratford Army Engine Plant (SAEP)** in Connecticut where gas turbine engines for aviation and ground propulsion systems are produced.

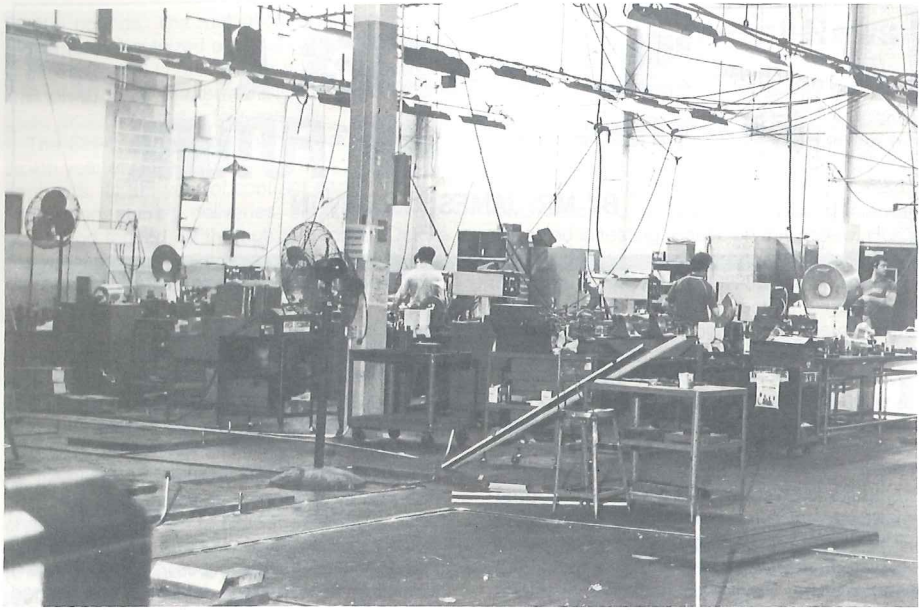
This joint venture was designed to achieve three significant reults: the effcient manufacture of high quality, cost effective products and the modernization of an Army-owned plant; enhanced business opportunities and more cost efficient operations for the contractor; and the transfer of technology for industry at large.

A three phased approach

The IMIP program, begun at SAEP in 1981, proceeded in three phases. During Phase I (Conceptual Design) the contractor first defined the factory "as is" — establishing a baseline of then-current operations against which future changes could be measured. Analysts looked at problem areas, and studied fabrication of discrete parts, the assembly and test of engines, manufacturing methods and technologies, and manufacturing information systems.

By September 1982, Phase II (Detailed Design) was underway in two areas. One called for detailed designs applying the latest proven, state-of-the-art manufacturing technologies for the factory floor in fabrication, assembly operations, quality assurance and control, factory support areas, and material handling systems. Implementation plans were also developed, including contractor initiatives beyond the scope of the original program.

Concurrently, manufacturing information system analysts were applying the latest group technology concepts to engine design and manufacture and to factory support systems for tools, gages and fixtures control, and plant maintenance. Generally, group technology methodology groups products, processes, and information into families by their similarities, and uses these family groupings to integrate design, development, and manufacture by means of a



ABOVE: A view of the Balance Room at the AVCO Stratford Plant before modernization. OPPOSITE PAGE: The same Balance Room after modernization.

continuous, progressive flow of engineering and manufacturing data.

Phase III (Implementation) is now ongoing and the factory is evolving into a blue ribbon "Factory of the Future." Approximately 1,200 machine tools and process equipment, enhanced with the introduction of modern machining technologies, will be arranged over 700,000 square feet of manufacturing space to improve work flow and create product designated machining centers.

This new arrangement is directed toward achieving productivity improvements that will reduce costs, improve quality, and reduce lead times to meet increasing schedule demands.

Factory design techniques

During the Phase I, Conceptual Design, and Phase II, Detailed Design, various computer techniques were used as design tools and for technical analysis to provide a logical approach to evaluate alternatives. The main tool used in factory floor design was OPSNET, an integrated set of modular factory design computer aids. Its core software weds traditional Production Flow Analysis with new concepts in Decision Support Networks, and its current configuration includes packages to identify part families, define manufacturing requirements, allocate owned resources, assess financial attractiveness, and define implementation requirements.

Early Implementation projects

An example of a completed IMIP project is a modernized Balance Room at the Stratford plant with new balancing machines, improved existing machines, and a modernized overall environment. The effects have been dramatic in increased employee morale, quality of work, and productivity. The latter indicator already shows a minimum of a 25% gain in a period of less than six months.

Modernization of the Receiving, Final Assembly, and Shipping Areas is also in process, along

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with plans for a Material Handling Pilot System using an **Automatic Guided Vehicle System (AG/VS)** which will be expanded into a plant-wide system during the modernization of the total manufacturing facility.

The modernization of Receiving with the introduction of AG/VS and an **Automatic Stacking and Retrieval System (AS/RS)** will reduce inventories through the reduction of dock-to-stock time from 21 to less than three days.

The upgrading of the Final Assembly area involves a complete rearrangement of the assembly flow and the introduction of kitting for sub-assemblies, increased use of pneumatic tools, and the establishment of completely integrated work stations. The complete environmental improvement should equal or exceed the productivity accomplishments in the Balance Room.

The ongoing complete overhaul of the Final Assembly is being accomplished with no impact on production schedules. The Shipping Area is due to be modernized in early 1985.

The integration challenge

A key concept supporting both design and implementation planning has been the compelling need for extensive integration. Accordingly, integration efforts are plant-wide, and the benefits have include increased efficiency, reduced costs, and more rapid and accurate performance throughout the plant, with greatly improved management visibility into, and control over, all aspects of plant operations. As an ongoing effort, integrated systems architecture studies are producing a logical data base to insure system-wide integration of existing and future data bases.

The early implementation projects described above, involving the beginning and the end of the production cycle, so to speak, do not pose the problems anticipated when the production floor itself is rearranged. A much larger group of elements must be integrated for the modernization of the actual manufacturing operation.

This process involves the introduction of new machines and methodologies, an intensive machine rehabilitation program, the rededication of human resources, the development of new systems and procedures, and extensive financial considerations. It is mandatory, therefore, to consider the preparation of a detailed factory Implementation Plan; a plan that will address or-

ABOVE: An aerial view of the AVCO Stratford Army Engine Plant (SAEP) in Stratford, Connecticut.

ganization, staffing, work plans, detailed activities schedules, and all the associated costs.

Moving from job-shop batches to in-line mass manufacturing of high precision gas turbines has presented many challenges. These have been answered in part by the introduction of highly automated machining systems for increased precision. Dedicated work centers and work stations provide other answers — like the Shaft Center, designed to process the myriad of shaft like parts efficiently and cost-effectively.

The near clean-room environment of the Balance Room, where rotating components are dynamically balanced, shows how other ideas have been implemented to improve the product and working conditions. Early studies, for example, considered the effects of color on human performance, and those lessons have been applied in the Balance Room, and increasingly throughout SAEP, and are leading to more efficient performance, reduced lost time, and significant improvements in attitude.

Concerns about general appearance and other housekeeping considerations have contributed to the design of the Final Assembly area where, with significant inputs from the work force, a clean environment conducive to professionalism in engine building has been achieved.

Essentially, in-line assembly lines operate on detail parts issued in assembly sequence in kit form. In its first significant use, electric and pneumatic tooling is being used to facilitate assembly, and automated systems for special assemblies are being developed. Visual aids show assembly sequences and other data vital for maintaining highest quality output, and work station loading requirements have been computed to provide continuous production and provide for separation between military and commercial products.

The bottom line

Striving for the "Factory of the Future" is a WIN-WIN-WIN situation for the Department of Defense and the United States Army, for the contractor, and for industry at large.

The technology being developed and proven under IMIP in the drive for the "Factory of the Future" is helping the nation upgrade its industrial base. IIIII

FIXED WING STATUS REPORT

BY LIEUTENANT COLONEL DON R. WATSON

IF the BIRD DOG was your first love and you have never really been convinced that any machine whose wings go 'round in circles is even supposed to fly, perhaps you will understand why we are so excited about where our utility fixed wing fleet is headed.

In order to insure that our latest production aircraft are equipped with "leading edge" technology and to support the upgrading and "keep 'em flying" efforts for the most diversified fleet within Army Aviation, we at AVSCOM's Weapon System Management Office for Fixed Wing Aircraft have assembled the most talented group of engineers, logisticians, and support staff that this, or anyone's, Army could produce. Here is a snapshot of some of our current efforts.

C-12

Since the initial procurement of six aircraft in 1973, the C-12 has progressed through the A, C, and D models (the B model belongs to the Navy) with new production D models planned for deliveries beginning in late 1985. Perhaps no area has experienced more rapid development than avionics. Our new deliveries have upgraded avionics with an SPZ 4000 digital autopilot system which will provide dual flight directors, altitude preselect, radar altimeter, and an air data computer for true airspeed.

The C-12 will finally get the KTU 709 TACAN tactical navigation system which you U-21 and U-8 drivers have been flying for some time. Perhaps the most exciting development has been in long range navigation. We have installed the KNS 660 with VLF OMEGA and data base. This satellite based navigation system has a memory capability which keeps track of, and can navigate you to, any airport with a runway of 3,000 feet or longer and to any VOR station or airway intersection. Additionally, the full alpha and numeric control unit provides frequency management of radios, TACAN, and automatic direction finder.

The new KWX 58 four-color weather radar has navigation overlay graphics, checklists, emergency procedures, and preprogrammed flight plans (100 maximum, 25 waypoints each). This system contains blanker circuits for aircraft survivability suit compatibility.

Staying smart

The system's NAV blending and TACAN update permit use of the OMEGA during an **radio navigation (RNAV)** approach. The RNAV with its great circle navigation, vertical navigation capability, and ability to recognize five-digit identifiers makes us wonder how in the world it is able to stay smart. Easy. The data base is updated every 28 days using a 2.5 inch floppy disc.

Airframe improvements on the new C-12s will include a triple-piece wing spar, shear-wing attachment bolts (versus tension), and hydraulic landing gear.

Now let's return to earth and look at our current fleet. Although the average age of the C-12 is only six years, some of the airframes are already exceeding 8,000 hours. A significant **Product Improvement Program (PIP)** is currently in process to convert all C-12A aircraft with PTGA-38 engines (750 SHP) to PT6A-41 (850 SHP) with the addition of auto-feather and autosynchronization. This program is nearing completion, with the redesignation of all C-12A aircraft to C-12C.

We are currently in the process of accomplishing another PIP on the first 13 C-12s pro-

duced, involving installation of auxiliary fuel tanks which they presently do not have. The Army C-12 utility fleet, which includes the aircraft assigned to the Army National Guard, will consist of 74 C-12s and 18 C-12Ds. Special Electronics Mission Aircraft are not addressed here.

U-21

U-21 deliveries began in 1967, and this aircraft has proven to be an Army workhorse. It will continue as a first-line Army utility aircraft. The average age of the U-21 fleet of 120 aircraft is 16 years, with some aircraft currently approaching 11,000 flight hours.

PIPs are in process to improve the U-21A system integrity. The AN/APN 215 color weather radar has been installed in over two-thirds of the fleet. This set provides a continuous display of weather intensity confronting an aircraft in flight. Information displayed is sufficient for weather penetration, as well as weather avoidance. We plan to install this PIP on all U-21A aircraft by the end of FY '85.

A new commercial state-of-the-art avionics system and new avionics wiring have also been installed in over 75% of the fleet. The installation includes an autopilot and flight director. RNAV provisions have resulted in fuel savings of from 3 to 7% for aircraft equipped with this PIP, depending upon locations and flight patterns.

This installation has proven to be more reliable than the old military specification avionics and enjoys a high level of customer satisfaction. When additional funding for kit procurement is approved, all aircraft in the U-21A utility fleet will have this system by the end of FY '85.

The inspection provision PIP will add wing access doors and aileron inspection covers for inspecting areas of the interior center wing section and ailerons. Installation of this PIP began during FY '84 and is continuing. Approximately 10 aircraft have this PIP installed. Laboratory testing has indicated that fatigue cracking of the spar cap is also possible.

Service experience on both commercial and military aircraft having the same configuration indicates that interior corrosion is possible at the hinge points of the ailerons. This modification will provide the means for inspection and early detection of corrosion and cracks.

Various configurations include three U-21J and five U-21F models, all assigned to Davison Aviation Command, Ft. Belvoir, VA. Although designated U-21Js, these aircraft were prototypes for the C-12 aircraft and share a common profile and, to a high degree, a common configuration with C-12 aircraft.

These aircraft perform routine VIP, administrative, and staff transportation missions. The logistic support of these aircraft differs from most of the U-21 aircraft that are available from the Army supply system, in that these aircraft are supported logistically from commercial sources.

U-8

The entire U-8 fleet of 49 aircraft is assigned to the Army National Guard and the Army Reserves. These aircraft have been in service for many years and have logged thousands of flight hours. Plans had been made to phase these aircraft out of the Army inventory by the end of FY '87; however, as in the case of other fixed wing aircraft, no firm commitment for new replacement aircraft has been made.

The old military specification avionics were fast approaching the marginal supportability dates when support of the equipment would no longer be feasible or cost effective. As a result, a PIP was developed to replace and update the old avionics with new commercial state-of-the-art avionics. This effort was completed this year and the entire fleet has been upgraded. This resolves the logistic support problem of the old system and significantly reduced the failure rates and the erratic operation of the old system.

In addition, efforts are underway to improve performance and reliability of the engines on the U-8F aircraft with an Excalibur conversion.

With the U-8F fleet rapidly approaching its 20-year service life, an obvious question arises as to what effect the new avionics and engines will have on airframe phase-out. A good rule-of-thumb is to add 10 years after application of the modification, provided an airworthiness release has been issued ensuring structural integrity of the system past the retirement date.

T-42

The T-42 has been in service since 1965 and

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is primarily used to train Army aviators in multi-engine instrument flight training. Of the total procurement of 55, we have 53 T-42s still in service in the Army National Guard, Army Reserves, and Active Army. Most of those in the Active Army are located at Ft. Rucker as flight trainers.

The T-42 recently underwent an avionics update, i.e, VOR/ILS Marker Beacon AN/ARN-123, AN/ARN-124 distance measuring equipment, UHF-20A Radio, and ASN-43 Gyro Magnetic Compass. Like the other workhorses of the fixed wing fleet, we expect this aircraft to be in service until at least 1990.

C-7

If the tower tells you to hold for the CARIBOU on the runway, they probably are not talking about the four-legged beast from up north. Remember some 18 years ago when the C-V2 went to the Air Force? We now have 28 back in the Army as the C-7 serving the Golden Knights, MICOM, and the Army National Guard. Efforts are underway to determine the best method of continuing mission support — through upgrade or replacement.

The task of managing fixed wing weapon systems as diverse as UV-18 TWIN OTTERs with the Army National Guard, UV-20 PLATUS PORTERs in Europe, T-41s at West Point, and U-3s with the Army National Guard and Army Reserves, along with a major effort to replace our T-28s at Edwards Air Force Base and at Ft. Bragg, all present some unique challenges.

Working through the General Services Administration with various law enforcement agencies, we are the point of contact for the confiscated aircraft program. To date, 19 well-equipped, multi-engine fixed wing aircraft have been netted for the active fleet, Army National Guard, and Army Reserves, at virtually no cost to the Army. These assets are being used primarily to displace old U-3 aircraft which are being turned in one-by-one for reasons of economic unsupportability and airframe fatigue.

We of the fixed wing community are continually aware of the priority and funding obstacles we must overcome to provide the field with safe, fully-mission-capable aircraft. The challenge is for both AVSCOM and the user community to work closely together to sustain the operational capability of our fixed wing fleet and it is a challenge we readily accept. FLY SAFE!

AVSCOM'S OTHER WSMO'S...

We regret that space limitations prevent us from printing reports from each of the WSMO's in the Systems Management Directorate.

MR. VALENTIN C. BERGER WSMO FOR GROUND SUPPORT EQUIPMENT (AMSAV-WS) 1294

MR. IVY I. SMITH WSMO FOR MULTIAPPLICATION ITEMS (AMSAV-WK) 1231

LTC JAMES J. MOLLOY WSMO FOR SCOUT/OBSERVATION HELCPTRS (AMSAV-WO) 1229

LTC JAMES R. ARMSTRONG WSMO FOR SYNTHETIC FLIGHT TRAINING SYSTMS (AMSAV-WG) 1238

LTC DONALD A. FOSTER WSMO FOR UTILITY HELICOPTERS (AMSAV-WU) 1249

THE DIRECTORATE FOR MATERIEL MANAGEMENT

BY COLONEL DEWITT T. IRBY

THE Directorate for Materiel Management at the Aviation Systems Command functions as the **National Inventory Control Point (NICP)** for Army Aviation items. In this role, the directorate is responsible for managing more than 49,000 items for use around the world. This vital function insures the readiness of the Army's fleet of more than 9,200 aircraft by keeping the logistical pipeline filled with the right items, in the right quantities, at the right time, and in the right place.

As NICP, the directorate has management responsibility for wholesale supply of repair parts.

The directorate performs its mission by first determining the requirements for spare parts. The new item is then catalogued, and its procurement is budgeted for. Finally, the item is distributed worldwide on the quickest and most cost efficient mode of transportation.

In addition to the vitally important role as NICP, the Directorate of Materiel Management is involved in a number of programs to further insure the readiness of Army Aviation equipment worldwide. These programs include: the Total Package/Unit Materiel Fielding Program; the Army Flying Hour Program; the Aviation Intensive Management Items-Expanded Program; the Weapon System Review and Analysis Program; the Spares Program; and the Crisis Management Team Program.

The total package concept

The **Total Package/Unit Materiel Fielding (TP/UMF)** concept was developed to lessen the burden of new equipment fielding on the Army using units.

Prior to 1981, the Army used what was known as a "free flow" method of fielding. This technique required the fielding command to furnish Support List Allowance Cards to the user of each new system fielded. The user was then required to accomplish the majority of the work involved in making sure the unit received all end items of equipment, spare parts, technical manuals, and other support items necessary.

The Army has improved the free flow technique with the total package concept.

The Total Package/Unit Materiel Fielding Program evolved from previous methods. In addition to its primary purpose of relieving the burden on the user, the system also results in improved materiel control and a timely and coordinated delivery of systems and essential support items to the field.

Under the TP/UMF Program, AVSCOM is responsible for identifying the requirements of the support package for each fielding, and finalizing those requirements during a meeting with the user. AVSCOM then requisitions the materiel, taking whatever action is necessary to provide all the items needed in sufficient quantity.

The flying hour program

In February, 1984, the Army's Deputy Chief of Staff for Operations released the FY '85-90 flying hour program. This program showed a significant increase in the flying hour rate beginning in FY '88 designed to provide sufficient hours for the total mission, including the required hours for proficiency training.

The Deputy Chief of Staff for Logistics then requested an analysis of increased hours for the UH-1 HUEY, AH-1 COBRA, and the OH-58 KIOWA fleets for FY '84. The proposed increase for each system amounted to approxiamtely 5% and was analyzed utilizing a mobilization model.

ABOVE: Two crew members are shown on the ramp of the CH-47 Helicopter Icing Spray System (HISS) during winter icing tests conducted in Minnesota by AVSCOM's Aviation Engineering Flight Activity.

AVSCOM's review of the product revealed that, through increased intensive management of critical items, the proposed increase could be supported. The AVSCOM analysis was approved by the Vice Chief of Staff of the Army in April, 1984. Approved increases of 32,400 hours for the UH-1, 5,000 hours for the AH-1 , and 10,000 hours for the OH-58, were distributed to the field in May, 1984.

The Vice Chief of Staff then directed a supportability analysis of increasing the flying hour program for FY '85, '86, and '87 for these three aircraft, plus the UH-60 BLACK HAWK, in order to smoothly transition from FY '84 to FY '88, rather than suddenly surge from FY '87 to FY '88. The analysis was conducted by utilizing the requirements determination system with and without the proposed flying hour changes. Additional dollars required were extracted by comparing the requirements generated before and after the change. This procedure identified the dollars required; however, it did not fully address the supportability issue. Several math models, intended to forecast supportability under various flying hour scenarios, are being investigated for this purpose. Sufficient data should be available in 1985 to provide supportability analysis to the Army Materiel Command.

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COL DEWITT T. IRBY CURRENTLY SERVES AS THE DIRECTOR FOR MATERIEL MANAGEMENT AT THE U.S. ARMY AVIATION SYSTEMS COMMAND.

AIMI-X

Another project currently under development by the Directorate for Materiel Management is an automated system to track high dollar value critical aviation components. The project, which was assigned to AVSCOM by the Army's Deputy Chief of Staff for Logistics, is intended to provide 100% visibility of selected aviation components, by serial number, throughout their life cycle. The system will be required to maintain the inventory, location, condition status, hours since new, hours since last overhaul, and whether the item is stored or installed.

In order to accomplish the task of setting up this program, an already existing program, the **Aviation Intensive Management Program (AIMI)**, is being expanded. The AIMI Program was established to intensively manage selected aviation items which, because of their procure-

ment value, cost of overhaul, or criticality of source of supply, were determined to be in short supply.

The objective of the new AIMI-X Program is to establish a management system by which aviation items can be tracked through their life cycles so as to gain data for the following purposes:

- ascertain unit inventory.
- measure pipeline segments or times.
- verify status or condition of separate serial numbered items.
- reconstruct engine life histories.
- provide a statistical base for **Estimated Life Expectancy (ELE), Time Between Overhaul (TBO), Mean Time Between Overhaul (MTBO),** and **Mean Time Between Failure (MTBF)** between computations.
- verify inventory receipts of new procurement items.
- facilitate justifications of budget calculations for replacements, procurement programs, and overhaul programs.

Review and Analysis

The directorate is using the Weapon Systems Review and Analysis Program to concentrate on readiness aspects unique to each major weapon system. In this way, representatives from the directorate, as well as other AVSCOM elements, can work as a team to identify and overcome the problem areas affecting the system.

Data elements shown for analysis include the actual and forecast flying hour program, **Army Stock Fund (ASF)** demands, and **aircraft procurement Army (APA)** issues and returns. The R & A meetings also include funding profiles with current commitments and obligations for APA and ASF items, as well as trend charts depicting overall system stock availability, ASF stock availability, APA stock availability, **Not Mission Capable Supply (NMCS)** stock availability, ASF NMCS stock availability, and APA NMCS stock availability.

Personnel from the directorate are joined by other managers working with the system, including representatives from the project manager offices, the Directorate for Procurement and Production, and Directorate for Maintenance, and Directorate for Engineering, and the Directorate for Product Assurance.

Maintenance, and Directorate for Engineering, and the Directorate for Product Assurance.

The spares program

In response to initiatives set forth by the Secretary of Defense, AVSCOM has identified a number of **Spare Parts Review Initiatives (SPRINT)**. The most significant SPRINT initiative calls for implementation of an annual buy concept. Implementing this concept will reduce the volume of procurement work directives and faciltitate the procurement of economic quantities.

In the spring of 1984, AVSCOM was granted authority for a minimum 12 month reorder cycle on all items, resulting in a buy which covers an annual period. This causes a reduction in the number of procurement work directives processed, as well as an ability to qualify for unit price breaks as a result of the larger quantities ordered.

Crisis management teams

Recognizing the importance of the depot overhaul program in insuring the availability of key aircraft components, the directorate is currently in the process of establishing crisis management teams to identify problem areas which could result in spare parts shortages needed for the overhaul of critical components, and to work toward avoiding them.

The program began in 1983, when a team was formed to work with Corpus Christi Army Depot personnel to overcome an Army-wide shortage of T53-L-13BA engines. The shortage resulted from a decline in engines overhauled at the depot facility due to a shortage in spare parts needed for the overhaul.

As a result of the success of the T53 Crisis Management Team, teams are being formed for each major weapon system. The team approach is expected to result in improved output from overhaul facilties.

Moving ahead

The Aviation Systems Command is moving forward in many areas involving materiel management. We recognize that in today's changing environment the old ways of doing things will not always be the best. Willingness to innovate is a key to our continued support to the field. Our motto, however, remains unchanged: "KEEP 'EM FLYING!" IIIII

SPARE PARTS: A NEW CHALLENGE

BY MR. JAMES R. BRENNAN

SINCE its establishment in November, 1983, the Aviation Systems Command's Program Manager for Spare Parts has pursued implementation of the **Secretary of Defense (SECDEF)** spare parts acquisition initiatives to improve overall command management of spare parts procurement.

We have developed a three-pronged management approach to establish policies and procedures within AVSCOM that increase competition and preclude pricing abuses. This approach includes the development of individual employee awareness, performance of audits and investigations of selected pricing issues, and implementation of automation initiatives to assist in efficient spare parts acquisition planning and contract execution.

Spreading the word

The PM for Spare Parts has waged an extensive publicity campaign throughout the command. We displayed flyers and posters, published newspaper articles, and held conferences and training sessions, to disseminate policy and guidance on procedures and to define "intrinsic value" and "fair and reasonable price".

We advised our work force to be aware of aviation parts bought from prime contractors with the potential for break out for competitive procurement and to challenge perceived excessive prices. We have established our own HOTLINE and have encouraged the utilization of all government HOTLINES and Command Suggestion Program for this purpose.

We have, in effect, unleashed the best team of Army Aviation auditors available — our own government personnel — to ensure the SEC DEF goals and objectives are effectively implemented. We have held constructive dialogs on spare parts acquisition with our major spares contractors to advise them of our resolve to keep prices under control and to solicit their cooperation.

AVSCOM pamphlet 690-4, "Incentive Awards — Spare Parts," contains guidance for honorary recognition of both civilian and military employees who make specific individual contributions to the program. Provisions also exist to bestow honorary awards on contractors who make noteworthy public service contributions in the spare parts area.

By officially recognizing deserving personnel, the command expects not only to increase morale and the initiative to do more individually, but also to collectively motivate our work force as a whole to accomplish our objective of purchasing spare parts at fair and reasonable prices.

An intensified effort

We have intensified our educational efforts regarding spare parts acquisition by conducting classes emphasizing the key pricing principles involved in our spare parts acquisition initiatives: our responsibility to obtain a fair and reasonable price; the requirement for intrinsic value analysis; the relationship of price to item value; current policy guidance on spare parts acquisition; individual employee accountability for assigned procurement actions; and the necessity for complete supporting contract file documentation.

Spare parts responsibilities are being included in individual employee performance standards. We have made our employees aware of the issues, trained them, and now we are using the existing personnel evaluation system to motivate them to perform.

Our spare parts publicity, awareness, and educational efforts have been successful. Employees are asking questions and bird-dogging **Army Master Data File (AMDF)** and contract prices for instances of potential overpricing. They are also submitting suggestions to improve logistics and contracting procedures and recommending particular items for breakout from the prime contractor.

Five hundred and seventy five specific price challenges were directed to the command in FY '84. All price challenges undergo detailed technical and procurement analysis to determine if the purchase price exceeds the intrinsic value of the item and/or if the item was obtained at a fair and reasonable price. If the price paid is determined to be excessive, a voluntary refund is requested from the contractor.

Competitive advocacy

The command has complemented its functional work force efforts in the spare parts area with a Competitive Advocacy Program to ensure competition receives the emphasis and attention required by Public Law, regulation, and the spirit and intent of current acquisition initiatives. Command-wide policies and procedures ensure that AVSCOM programs to increase competition in the acquisition process are systematically planned, intensively managed, result-oriented, and auditable for reporting purposes.

The AVSCOM Deputy Commanding General for Procurement and Readiness, **BG Michael J. Pepe**, is the designated Command Special Advocate for Competition. He is supported by designated Competition Advocates at AVSCOM subordinate activities and by the Program Manager for Spare Parts as a special assistant.

In addition, each Project, Program, or Product Manager is designated as a Competition Advocate for his respective aircraft weapons system to ensure that the management oversight required to achieve maximum possible competitive savings is exercised.

The Special Advocate for Competition functions through an Executive Council for Competition, a policy advisory group comprised of directors and office chiefs, and an Ad Hoc Committee for Acquisition Initiatives. The functional implementation arm of the Executive Council is comprised of senior functional employees from all command organizational elements.

The Executive Council for Competition provides management expertise and advice to the Competition Advocate to ensure that opportunities for competition throughout the command are not lost by restrictive need statements, unnecessarily detailed specifications, inadequate acquisition planning, or by arbitrary action. The Ad Hoc Committee initiates, coordinates, and monitors command functional actions necessary to implement policies to increase competition.

Sharing our plans

Our **Competition Advocate's Shopping List (CASL)** provides a means of sharing our in-house plans for the purchase of spare parts with contractors in the hopes of increasing competition. The greatest potential for identifying Army Aviation parts which can be broken out from prime contractors for competitive procurement, or procurement from the actual parts manufacturers, lies with the contractors themselves.

Two microfiche listings are provided to interested contractors designating two budgets by which Army Aviation spare parts are funded. These listings constitute an attempt to produce an advanced procurement planning document for contractors' use. Contractors are cautioned that, while the listings respresent the Army's forecast at the time of issuance, actual procurement of parts and quantities over the next 12 months may vary from the listings due to changes in the Army's requirements.

Specific instructions are provided on how contractors should submit requests to be placed on the bidders list, requests for source approval, and their lists of available surplus. It is anticipated that the source approval actions, accomplished prior to the initiation of an actual purchase request for a particular item, will preclude delays in the procurement administrative process. We are making an effort to identify what acceptable surplus is available in order to reap the benefits of lower prices.

Several unique automation initiatives to improve spare parts pricing have been developed and are being implemented which deal with systemic logistics and contracting issues. One such

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computer program ensures the consolidation of like requirements — **National Stock Numbers (NSN)** — to reduce the number of requirements documents — **Procurement Work Directives (PWD)** — generated and in the hands of buyers. This allows for better pricing due to the larger quantities involved.

This system will also provide the capability to suspend the generation of a new requirements document if one already exists for the same item, and to notify the originator that there is an unawarded requirement in the hands of a buyer. This procedure allows item managers to review the open purchase request and the new purchase request in coordination with the buyer and make a decision whether or not to consolidate the two quantities. It also involves an analysis of the last buy of the item to determine the annualized percent of increase and the required level approval.

Progress in coding

We are making noteworthy progress in improving competetive coding of our Army Aviation managed items. Thirty-six percent more Acquisition Method Codes were improved during FY '84 than during FY '83. We averaged 450 DAR Supplement No. 6 screenings per month in the FY '84 time frame with an average of 101 (22%) previously noncompetitive items competitively coded per month. We estimate that the acquisition method coding improvements will save at least $10.8 million when the items are actually purchased — a 75% increase in savings over the same period in FY '83.

AVSCOM is making significant strides in achieving the goals and objectives set forth in the SECDEF spare parts acquisition initiatives guidance. We have reaped substantial benefits from our breakout efforts in the areas of small business and in the breakout coding improvements already discussed resulting in expressions of interest from vendors to produce over 6,000 Army Aviation items previously contracted for on a sole source basis.

We are committed to continue these efforts in an aggressive manner — to institutionalize our efforts, to change noncompetitive attitudes, to pursue pricing reforms, and to establish functional and managerial checks and balances to preclude future pricing abuses. At the same time, we will continue to investigate specific price challenges and to take corrective action with our personnel and our contractors.

The contractor's role

What is the contractor's role in this new competitive arena? In conjunction with correspond ing government efforts, it is essential that contractors change their attitudes, re-establish and sharpen their competitive pricing and negotiating skills, and re-examine their estimating and accounting systems. They should take the initiative to nominate parts to breakout for competitive procurement. At the very least, we can pursue a second source together.

If government ordered quantities do not make production sense, contractors should advise us of what does make economical sense. It is also important for contractors to identify which of their parts can be successfully catalog priced. Above all, we need to communicate, to exchange ideas and recommendations that serve both government and contractor interests.

Where are we heading?

Now, where does Army Aviation go from here? We must understand where we are and how we want to move toward more competition. A rapid transition may adversely impact readiness in some cases. Transition to more competition by traditional methods — development of competitive technical data packages and contractor qualification of additional sources — may deny us the opportunity to investigate better ways of achieving our competitive goals and objectives.

The absence of an acceptable level of competition in Army Aviation should be viewed as a challenging opportunity to explore new and unique ways of achieving competition in a cooperative effort between government and industry.

We have a joint challenge to demonstrate that we in Army Aviation are doing business differently than we have for the past 20 years. Success will require determination, initiative, implementation of innovative approaches, communication, and a "can do" and cooperative attitude on the part of both government and industry. IIIII

RC-12D: A GREATLY IMPROVED GUARDRAIL

BY MR. CLEMENCE P. MUDD, JR.

THE GUARDRAIL family of systems was initially developed in the early 1970's as a unique airborne and ground processing system to solve a deficiency at the Corps level in tactical electronic intelligence.

The **Improved GUARDRAIL (IGR)** program was approved as a Product Improvement Program in 1979 to infuse new technology to better cope with the current and the projected threats and to rapidly transfer information to the designated users. The IGR program is an outstanding example of innovation to meet this unusual, low density requirement by employing a high degree of commercial parts and equipment and life cycle support for the airframe.

Increased readiness

There are many system features which have been greatly improved under the Product Improvement Program for the GUARDRAIL V which created the Improved GUARDRAIL V program. Of the improvements, one of the most significant was the adoption of the RC-12D as the airborne platform, replacing the RU-21 airframe. The RC-12D is a modification of the very reliable C-12D airframe to perform the **communications intelligence (COMINT)** mission for the Army.

Long before the IGR program, the C-12 had established itself as possessing a high readiness capability and has established an enviable record in the field.

Improvement in reliability and operational readiness is a paramount goal of the IGR program. One of the major changes with the adoption of this new airframe is the maintenance concept. With the exception of the IGR mission equipment, the RC-12 will be totally maintained by representatives of **Beech Aerospace Services, Inc. (BASI)** which is headquartered at Jackson, MS.

This maintenance philosophy will be similar to that in effect for the C-12 fleet on a worldwide basis. Just as with the C-12 maintenance contract, BASI has a contractual guarantee that the Army will have a readiness rate of 80% for the RC-12D aircraft. Within the C-12 fleet, BASI has demonstrated a readiness rate significantly higher than the 80% guarantee.

The BASI field representatives will be responsible for all troubleshooting, replacement, and associated maintenance actions for the airframe, engines, avionics, and related aircraft subsystems. The Army will be responsible for the maintenance actions associated with the IGR mission equipment.

The BASI maintenance concept is to establish a pool of spare parts at each beddown base, usually at the **line replaceable unit (LRU)** level. High dollar and low usage airframe parts are retained in a parts pool at Jackson, MS. With the LRUs and high usage items on site, parts are easy to obtain for the replacement. If a low usage part or high dollar part, such as an engine, is required, BASI typically gets the part from Jackson, MS to the beddown base within 24 hours for installation and the aircraft will be airworthy in a short time.

This expedited maintenance is facilitated and accomplished by utilizing a very high percentage of "off the shelf" commercial equipment and avionics.

Avionics configuration

The RC-12D basically utilizes the identical equipment installed and certified on the Army

ABOVE: The RC-12D Improved GUARDRAIL (IGR) aircraft, which performs vital communications intelligence missions for the Army, is under development by the AVSCOM PM for Special Electronic Mission Aircraft .

C-12 fleet. It provides the pilot and copilot with the avionics and instrumentation required to establish and maintain an accurate flight course and position and to make instrument approaches under **Instrument Meterological Conditions (IMC).** The most significant change is in the navigational group which has a Delco Carousel IV-E **Inertial Navigation System (INS)** installed with the capability to be updated by a SANS-706 TACAN tactical navigation set.

The output from the INS with the TACAN update is utilized by the mission equipment in determining emitter locations and the output also interfaces the crew for navigational purposes. Position and altitude data are also supplied by the INS to the automatic flight control system, the weather radar, and the horizontal situation indicator and the radio magnatic indicator. A visual display is provided in the cockpit of present position data in either **Universal Transverse Mercator (UTM)** coordinates or latitude-longitude geographic coordinates.

In addition to meeting mission accuracy requirements, the outstanding reliability was one of the primary considerations in selecting the Carousel for the IGR mission. The USAF has demonstrated in excess of 2,000 hours mean time between failure in the cargo-passenger mission and not a single hard failure of the INS was experienced during the test and integration activities at the contractor's facility.

Aircraft performance

The RC-12D is an FAA recertification of a derivative of the Beech Model 200 business aircraft. Similarly the earlier RU-21 aircraft were FAA recertifications of a derivative of the Beech Model 90 business aircraft. The RC-12D is a pressurized aircraft, unlike the RU-21 aircraft. This makes a significant contribution to crew comfort and efficiency.

During long missions at altitudes over 10,000 feet, RU-21 crews must utilize oxygen throughout the flight and this contributes to crew fatigue. The RU-21 is capable of loitering for about 4.5 hours maximum; however, the RC-12D can remain on station for about six hours.

The RU-21 has a gross weight of 10,200 pounds, but the RC-12D has been recertified for 14,200 pounds. The RU-21 is limited to a ceiling of about 20,000 feet but, in comparison, the RC-12D has a capability to reach 28,000 feet.

All of the RC-12 aircraft performance is well tested and documented through the Beech Aircraft Company's recertification program with the FAA and the testing performed by the Army Aviation Engineering Flight Activity at Edwards AFB, CA.

Summary

The IGR will provide an increased mission capability and a more responsive intelligence product for the field commander. Greatly increased reliability and operational readiness can be expected from the new RC-12D airframe.

In the case of the GUARDRAIL family of programs, and especially the new IGR, it makes a lot of sense to make maximum use of off the shelf commercial technology to keep the cost of these low density systems within reason. IIIII

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ANCHORS AWEIGH — Four Army Aviators attending the Navy Command and Staff College at Newport, RI, are shown above with Rear Admiral James E. Service (center) President of the Naval War College. From left to right: MAJ Stephen S. Davidson, LTC David C. Kirk, MAJ (P) Thomas S. Allen, and MAJ George D. Nippell.

A NEW MASTER AVIATOR — MAJ (P) Allen is shown at left with his wife, Mary Lou, and Rear Admiral Service after receiving his Master Army Aviator wings from the Admiral.

BROKEN WING AWARD — CW3 Tholen Crosby (center) received the coveted Broken Wing safety award and an Army Achievement Medal recently from COL Thomas M. Walker, Commander of the Corpus Christi Army Depot, as Mrs. Crosby looked on, for his near heroic actions in the air over South Bend, IN, last February. On that occasion, the throttle on the number two engine of the Depot's U-21 turbo-prop aircraft became frozen at cruise speed and could not be retarded. Despite this life-threatening emergency, Crosby landed the aircraft, with a co-pilot and five depot employees aboard, under difficult runway icing conditions, without sustaining any damage or injuries.

FAMILY FUN DAY — Nearly 300 people gathered recently for a special day sponsored by AAAA's Fort Hood Chapter. LEFT: CW2 Wayne Walker stirs his award winning entry in the Championship Chili Cookoff, while CW3 Rick Brooks helps out. Both are from C CO, 228th Avn Air Attack Bn. RIGHT: Members of D CO, 34th Spt Bn, 6th Cav Bde (AC), kill their "invisible goat" so they will have "blood" to add to their chili.

MUSEUM BUILDING GIFT — Mr. William P. Jones, left, Director of Helicopter Programs and Product Support for the Boeing Vertol Company of Philadelphia, PA, has presented a check for $10,000 from Boeing Vertol to the Army Aviation Museum Foundation to help in the construction of a new museum building. This check, presented to Foundation Vice President Bill Howell, brought Boeing Vertol's total donation to the Museum Foundation up to $50,000 since 1979, and was accompanied by a pledge of an additional $20,000 over the next two years.

BLACK AVIATORS MEET — The U.S. Army Black Aviators Association (USABAA) will hold its third annual meeting on June 13-16, 1985, at Marriott's Pavilion Hotel, One Broadway, St. Louis, MO. Persons interested in attending should contact William H. Gillispie, 1915 Claymills Drive, Chesterfield, MO 63017. Telephone: (314) 532-5171.

1985 - '86 REDBOOK — The 24th edition of the Transportation and Aviation Logistic Officer and Warrant Officer REDBOOK, dated January 1985, is now available. To order this compendium of active duty and retired officers and warrant officers, please send $6.00 to the Army Transportation Museum Foundation (ATMF), P.O. Box Drawer D, Ft. Eustis, VA 23604.

WHOOPS, SORRY! — While preparing our checklist for the AVSCOM photochart on pages 39-42 we somehow misssed the Aeromechanics Laboratory.

THANK YOU! — Special thanks to Mr. Howard DeMere, AVSCOM PAO, Ms. Liz Carson, who has recently left the PAO staff, and especially to Ms. Jan Finnegan, for their help with this issue.

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AAAA CALENDAR

DECEMBER 1984

■■DEC. 17. Aloha Chapter. Professional meeting. Speaker from Hughes Aircraft. 'Night Pilotage Systems'. Wheeler Officers' Club.

■■DEC. 19. Nurnburg Chapter. 1st Quarter meeting. Elections and USAREUR update. Pastorious Club.

■■DEC. 21. Mid-America Chapter. Tour of ARTCC Center, Olathe. LTC Jack Whittier, FAA DA Rep., guest speaker.

JANUARY 1985

■■JAN. 4. Valley View Chapter. General membership meeting. COL (P) Rudolph Ostovich, guest speaker. 'Army Aviation as a Combat Arm'. Peden Barracks O-Club.

■■JAN. 10. Fort Hood Chapter. Professional Meeting and Chapter Awards. 'The AHIP', a presentation by Bell Helicopter.

■■Jan. 15. Washington D.C. Chapter. Professional Social Meeting. BG Ronald K. Andreson, PM of the LHX Program, guest speaker. "The LHX Program within the Army". Pentagon Quality Inn.

■■JAN. 18. Lindbergh Chapter. Professional Luncheon Meeting. Mr. James Walsh, Beech Aircraft, guest speaker. 'The Star Ship 1 Program'. Engineers' Club of St. Louis.

■■JAN. 22. Citadel Chapter. Professional-social meeting. LTG Jack V. Mackmull, Ret., guest speaker. 'Helicopters in Support of Special Operations — and Grenada.' Jenkins Hall Auditorium.

■■JAN. 25. Monmouth Chapter. Professional-Luncheon meeting. GEN Richard H. Thompson, Cdr, U.S. Army AMC. Fort Monmouth Officers' Club.

■■JAN. 29. Greater-Atlanta Chapter. Professional-luncheon meeting. MG Ellis D. Parker, CDR, U.S. Army Aviation Center, guest speaker. Ft. McPherson O-Club.

FEBRUARY 1985

■■FEB. 6. Connecticut Chapter. Professional Dinner meeting. COL Gerald Lethcoe, guest speaker. 'Industry and the Aviation Branch'.

■■FEB. 7. Fulda Chapter. Chili Cookoff and Membership meeting. Airfield Hangar.

■■FEB. 16. Cheaspeake Bay Chapter. Valentine's Day Dance. Obie's Recovery Room.

■■FEB. 21. Corpus Christi Chapter. Pre-National Convention meeting. Elections. Officers' Club.

■■FEB. 22. Coastal Empire Chapter. Shrimp Boil, Professional meeting. MG Ellis D. Parker, Cdr, U.S. Army Aviation Center, guest speaker. Sunbeam Park.

■■FEB. 26. Hanau Chapter. Professional Meeting. Chapter Elections. Hanau Officers' Club.

■■FEB. 27. Monterey Bay Chapter. AAAA Ski Trip. 3 different ski locations, 5 days.

■■FEB. 28. Schwaebisch Hall Chapter. General Membership meeting. Dolan Barracks Officers' Club.

MARCH 1985

■■MARCH 2. Jack H. Dibrell (Alamo) Chapter. Static Display, Celebration ceremonies. MG Ellis D. Parker, Cdr, U.S. Army Aviation Center, guest speaker. Foulois Monument, Fort Sam Houston.

■■MARCH 1. Colonial Virginia Chapter. Professional Luncheon meeting. Ms. Kathy Abbott, NASA Langley Center, guest speaker. 'On-board Intelligence Systems'. Ft. Eustis Officers' Club.

■■MARCH 15. Old Ironsides Chapter. General Membership Meeting. Guest speaker from Bell Helicopter. Sadowski Theatre.

■■MARCH 16-23. 1985 USAREUR Region — AAAA Convention. U.S. Army Recreation Center. Garmisch, FRG.

■■MARCH 28-31. AAAA National Convention. Cervantes Convention Center (Professional sessions and exhibits); Sheraton St. Louis (Convention Hotel). St. Louis, MO.

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