ARMY AVIATION

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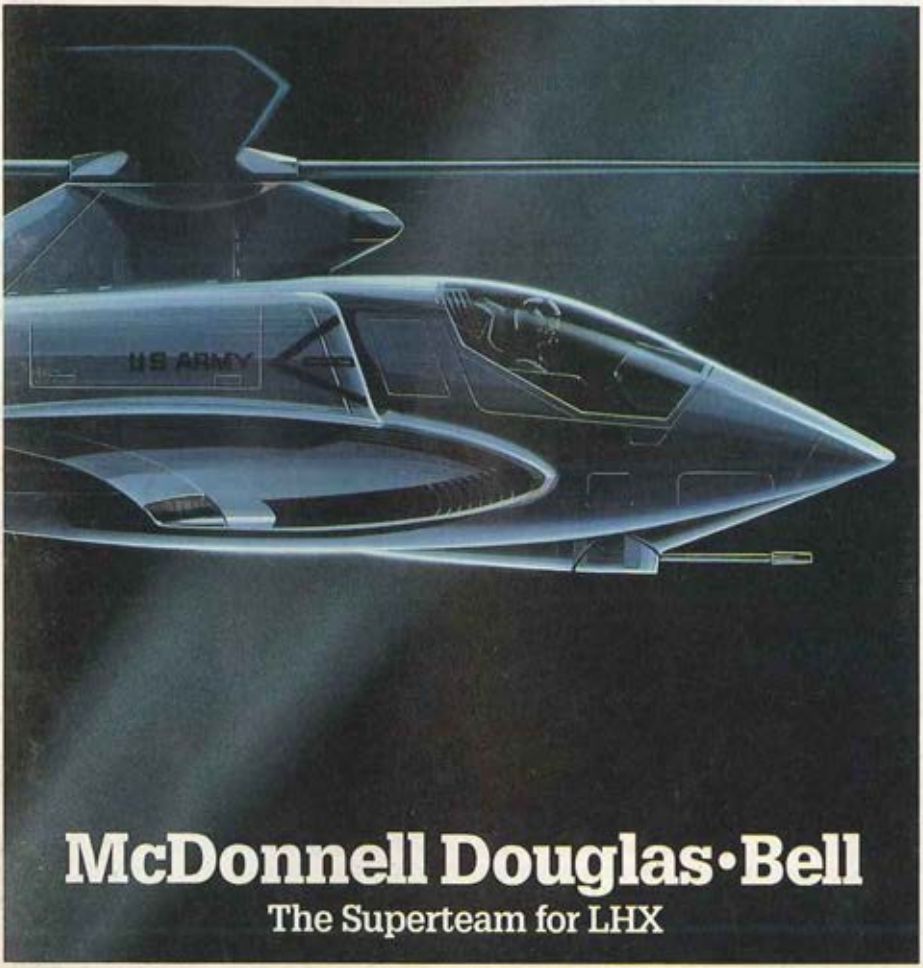

Army Aviation and the LHX: Planning for the Future

by The Honorable James R. Ambrose
Under Secretary of the Army,
Department of the Army
Washington, D.C.

IT has been a year since I wrote about LHX for *Army Aviation*. This year has been a very eventful one for the LHX program. As might be expected for a program which may well be the largest ever undertaken by the Army, there has been a lot of challenge, controversy, and review. Coming as it does in a time of large deficits and increasing pressure on defense expenditures, it should surprise no one that every aspect of the program will be closely scrutinized.

Regrettably, some of this challenge has taken the form of Congressional restraint on near-term funding which creates both a Catch-22 situation and a slowdown in the front-end ARTI risk reduction program. We are hopeful that we can provide the Hill with enough understanding of the importance of ARTI and the need for continuity of analysis and prototyping work to avoid any discontinuity of the effort.

Examining cost effectiveness

A key part of the 1986 effort, one which will continue through the early part of 1987, has been a massive analytical program to examine the cost effectiveness of the manifold missions, aircraft designs and mixes which have been advocated by the Army, OSD, or others. I don't have a complete count, but, including all the excursions, there have been hundreds of model runs. The insights gained have made important contributions to revisions of requirements, operational doctrine, and designs of both aircraft and mission equipment packages. I think it is quite likely that this is the most thoroughly analyzed Army project ever, at this stage of its evolution. These analytic insights will also have very useful application to other Army aircraft programs.

The issue of single pilot operation has become properly focused on target acquisition and weapons control. Remarkable progress has been made in demonstrating ease of flying the aircraft, via surrogate single seat aircraft, simulators, mock-ups and human factors testing.

A major step was taken when the industry, at both prime and sub-contractor levels, formed itself into two well-balanced teams. There is no question in my mind that a highly competent, tough, vigorous competition will result. The need for the exhausting, expensive, and time-consuming proposal effort that usually is required to reach this state can be replaced with a more concentrated focus on the essential performance, cost, and contractor commitment aspects of entering full scale development.

Industry-Government exchanges

Frequent and extensive Industry-Government exchanges, up to CEO level, have been very rewarding. They are among the most open and fruitful I have experienced. We intend to continue them. Both teams have benefitted as requirements have evolved and been modified from these discussions; and as the credibility and accuracy of the performance and cost estimates have improved.

The Army, with prodding from Congress, OSD, and the special DSB task force, substantially increased the competitive phase to include more extensive MEP prototyping and both single and dual pilot flyable versions of the LHX. We will benefit considerably from this support for a significant portion of the original Army program which has been cut back for affordability reasons.

(AMBROSE - Continued on Page 79)

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FORTHCOMING ISSUES

February 28, 1987—A General News issue, containing field reports from Army Aviation units and agencies worldwide.

March-April, 1987—AAAA National Convention issue, containing the complete program for the Ft. Worth event.

May 31, 1987—Report on the AAAA National Convention, as well as a General News issue.

FRONT COVER
An artist's rendering of a possible configuration for the LHX, as presented by the McDonnell Douglas-Bell "SUPERTEAM".

ARMY AVIATION

VOLUME 36 **NUMBER 1**

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ARMY AVIATION

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Due to a number of late-breaking developments on the LHX front — and our commitment to bring you the most timely and accurate information — we agreed with the Army's request to delay publication of the January issue so that all LHX writers could submit the most up-to-date information.

On another subject, in late 1986, Defense Secretary Caspar Weinberger ordered the Department of Defense to reduce its periodical costs from the estimated $22.5 million spent in fiscal 1985 to $10 million for fiscal 1987. For the Army, that means a reduction for periodical spending in FY87 from $9.6 million to $4.31 million.

Among the 41 command-level and service school publications suspended was the U.S. ARMY AVIATION DIGEST.

At its December meeting, the Army Aviation Association National Executive Board discussed the impact of the action and the possible role of ARMY AVIATION MAGAZINE in filling any editorial gap brought on by the DoD/Army action.

Major General George W. Putnam, Jr., Ret., AAAA President, tasked Brigadier General Rodney D. Wolfe, President of the Army Aviation Center Chapter, to chair a committee to explore this subject and report back at the AAAA April National Executive Board meeting.

To complement this action, our staff will be issuing a random survey asking readers to comment on this subject as well as the overall editorial content, style, and format of ARMY AVIATION MAGAZINE as it exists today.

I must emphasize that this will be a random sampling — and not every reader will receive the survey. If you wish to voice your opinion, please call me directly at (203) 226-8184 or write to ARMY AVIATION MAGAZINE, 1 Crestwood Road, Westport, CT 06880. The more we know about you, the better we can serve your interests. I look forward to hearing from you.

Lynn Coakley,
Editor-in-Chief

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The future is ours by design.

A busy end to a busy year at Fort Rucker

by MG Ellis D. Parker, Commander, U.S. Army Aviation Center and Fort Rucker, AL

THE month of December 1986 was a busy month at the United States Army Aviation Center — particularly the first two weeks. It was during the period 3-12 December that the Aviation Center hosted concurrently the Aviation Brigade Commanders' Conference; the 1986 AAAA Conference and Hall of Fame Ceremonies; and the Israeli/U.S. Aviation Symposium. It was enjoyable and exciting to see old and new friends and colleagues.

Aviation Commanders Conference

I had the opportunity during the Aviation Commanders' Conference to reflect on our beginnings, our accomplishments, and where as a branch we are going. I could not help but reflect to the approximately forty attending brigade commanders that though it may seem light years to some since I was one, I still remember with clarity how exciting and challenging my tenure as a brigade commander was, and how proud I was to have been one of the then seven aviation brigade commanders.

I exhorted them to be aware of their mission; to be amenable to change; and to always utilize the support and knowledge of those who serve with them — no matter what their rank. The conferees — including those of us from the Aviation Center and School — exchanged many ideas and opinions; discussed numerous topics; and examined our role in the Army of Excellence. We all came away from this conference more enlightened, refreshed, and confident in our mission as aviators and soldiers in the finest Army in the world — the United States Army.

Hall of Fame ceremonies

The 1986 AAAA Conference and Hall of Fame Ceremonies were significant in that they reminded us of our rich heritage and those who have played important roles throughout the history of Army Aviation. It was gratifying to see a number of former aviators — some of whom I had the privilege of having served with or under as a young, and then not so young, officer. It seemed we all had plenty to talk about.

One sad note however was to receive word of the passing away on 9 November of this year of Brigadier General William W. Ford (Ret.) in West Redding, Connecticut. General Ford was the first Director of Air Training for Organic Army Aviation in World War II, and contributed much to the

legacy of Army Aviation. Though he retired in 1954, General Ford maintained a great deal of interest in Army Aviation and championed it whenever and wherever he could. As an aside, General Ford flew his own aircraft until his early 80s. He was 88 at the time of his death. General Ford will be missed, and it can be said he was truly "Above the Best."

There were seven individuals inducted into the AAAA Hall of Fame at Ft. Rucker on 4 December 1986. One of the most moving segments of the ceremony was the induction of SFC Rodney J.T. Yano — deceased — into the Hall of Fame. SFC Yano was represented at the 1986 Hall of Fame Induction Ceremonies by his parents, Mr. and Mrs. Richard S. Yano of Kailua-Kona, Hawaii. SFC Yano was one of two of our seven Army Aviation Medal of Honor winners to be awarded their Medal of Honor posthumously during the Vietnam War. The induction of SFC Yano into the AAAA Hall of Fame gave those of us attending the ceremony an opportunity to reflect on the price we Americans are at times asked to pay to keep our nation — and all that it stands for — free for future generations.

Israeli/U.S. Aviation Symposium

From 8-12 December 1986, the United States Army Aviation Center hosted the Israeli/US Aviation Symposium. Some of Israel's most distinguished aviators were in attendance at the symposium. Some of the topics discussed were Aviation in Airland Battle, Air Assault Operations, Joint Air Attack Teams, Air-to-Air Combat, Combat Developments, and Army Airspace Command and Control (A^2C^2). In turn, the Israelis gave briefings on combined arms operations, air to ground operations by helicopter — particularly against tanks, and integrated cockpits.

We and our Israeli counterparts had the opportunity to exchange ideas on doctrine, technology, and logistics, and the Israelis enjoyed seeing our Post and Center, some of our aircraft, and the neighboring area. Both the Israelis and our participants at the symposium gleaned much from the respective presentations. We truly enjoyed the symposium and its attendant activities, and look forward to future exchanges with the Israeli aviation community.

Looking back at 1986

As we look retrospectively on Calendar Year 1986, we in the Army Aviation Branch have much to be proud of. We have seen the implementation of the AHIP into the Active Army Inventory; the fielding of the AH-64 APACHE at Ft. Hood, TX; the incorporation of new NVG devices into our training and flying components; the building, completion, and utilization of a new Combat Mission Simulator at Ft. Rucker which has revolutionized "How to Fight" training; the beginning of the full scale development program for the V-22 aircraft; and the movement on track of the LHX.

We had a great year in 1986, and I am looking forward to 1987. As I talk with the men and women of the Aviation Branch and their families throughout the Army, I observe their professionalism, pride, dedication, loyalty, and determination to be "Above the Best." Our nation is truly fortunate to have such men and women serving as we now have in the Army Aviation Branch. There are no better soldiers. IIIII

Coming next month in *Army Aviation*

A number of follow-on LHX reports, including:
- The T800 Engine Program status
- The "Metrication" of the LHX
- RAM/ILS in the LHX

Field Reports on:
- Reassessing the USAATCA at Ft. Rucker
- The Personnel Locator System (PLS)
- The AAH-PM on the APACHE
- BLACK HAWK/VOLCANO mine system
- Update on the TADS/PNVS program
- The Army's version of the V-22 OSPREY
- The ADOCS pilot program
- How to apply to be an Army astronaut
- JAAT Training at the 8ID
- The 4ID at Ft. Carson: Iron Eagles
- The I Corps Aviation Brigade
- The 5ID Aviation Brigade comes to Ft. Polk
- Who are the "ATHAPASKANS"?
- 25th ID: The view from Schofield Barracks

As well as Guest Articles from:
- GEN Glenn K. Otis, Commander-in-Chief, U.S. Army Europe & Seventh Army
- Brigadier General J.R. Chisolm, Cdr, 10 TacAir Group, Canadian Forces

From concept to reality: the single-pilot cockpit.

A systems integration milestone on the road to LHX. The ultimate simulator: a unique flying test bed that will demonstrate, in the air, technology developed by the Sikorsky team in the lab.

The goal: reduced pilot workload, so that one operator can fly day/night, all-weather, nap-of-earth missions.

UNITED TECHNOLOGIES
SIKORSKY AIRCRAFT

LHX: The future of Army Aviation

LHX: The future of Army Aviation

by GEN John A. Wickham, Jr.

ARMY Aviation, now a full partner in the Army's combined arms team, will face a variety of combat challenges in the 1990s and beyond. In high or mid-intensity conflicts, we must be ready to fight modern tank, motorized, and airborne forces like the Warsaw Pact armies or other similarly organized forces including Soviet surrogates. Less mechanized but otherwise well-equipped regular or irregular forces and terrorist groups can be expected to operate against our forces in most parts of the world.

In low intensity conflicts, the military threat may be light forces, insurgents, and terrorists. In order to combat these diverse and complex threats, Army Aviation must play its role — supporting ground maneuver forces and, increasingly, acting as a maneuver element itself — in both our heavy and light divisions, and throughout our corps formations.

Essential to the future

The LHX, an acronym for "Light Helicopter Family," is an essential program to the future of Army Aviation because it brings unprecedented technological advances to our aviation forces, enabling us to defeat the postulated threat well into the twenty-first century. The Light Scout/Attack (LHX-SCAT) and Light Utility (LHX-U) versions will replace nine models of Vietnam-era aircraft, including the AH1s, UH1s, OH58s and OH6s, which, in 1995, will average 25 years of age. Highly standardized, the LHX-SCAT and LHX-U will have common major components — engines, transmissions, power trains, and rotor systems — and have built-in test and diagnostic equipment, fewer mechanical parts, and higher rates of reliability in battle. Thus, their logistic and maintenance support requirements will be reduced significantly.

Operationally, the versatile LHX will be a day and night, adverse weather system with excellent hot-day, high-altitude performance. The aircraft will be small, agile, and survivable with NBC protection, fully integrated communications, and sophisticated navigation and fire control systems. The LHX will conduct nap-of-the-earth flight operations which are made possible by an integrated and automated cockpit with worldwide navigation capability and secure, EMP and EMI-hardened avionics. It will be self-deployable to many areas of the world including Europe and rapidly deployable by tactical air transports.

Air-to-air missions

Since Army Aviation must be prepared to conduct offensive air-to-air missions in order to survive and to protect our own armor capability on the battlefield, the LHX-SCAT will kill enemy helicopters as well as tanks. The LHX-Utility, as the name implies, will perform general purpose roles. Although able to carry limited cargo and troops, it will not be a replacement for the UH-60 BLACK HAWK which will perform "heavy" utility roles such as troop assault (up to 14 soldiers) and aircraft recovery.

Because of the small profile of the LHX and its survivability features, the pilot will "see the enemy without being seen." The weapons systems will be extraordinarily lethal. The LHX multipurpose weapons launcher will have internal or conformal pods with the capability of launching both laser and "fire-and-forget" HELLFIRE missiles, the HYDRA-70 family of rockets, and air-to-air missiles. A turreted gun, an integral part

GEN John A. Wickham, Jr., is the Chief of Staff of the U.S. Army, Washington, D.C.

of the system, will be capable of firing simultaneously with the missile or rocket systems.

A high-tech Target Acquisition System (TAS) and Aided Target Recognizer (ATR) will revolutionize the way enemy targets are engaged. The TAS will search, detect, track, cue, designate, and then present prioritized targets to the pilot to include: aircraft, tanks, air defense systems, APCs, and nonarmored ground systems. Fully integrated onboard sensors will permit the pilot to confirm enemy targets or friendly aircraft and override as needed. The TAS can engage multiple targets sequentially and permit the launching of ordnance in a very short time after detection.

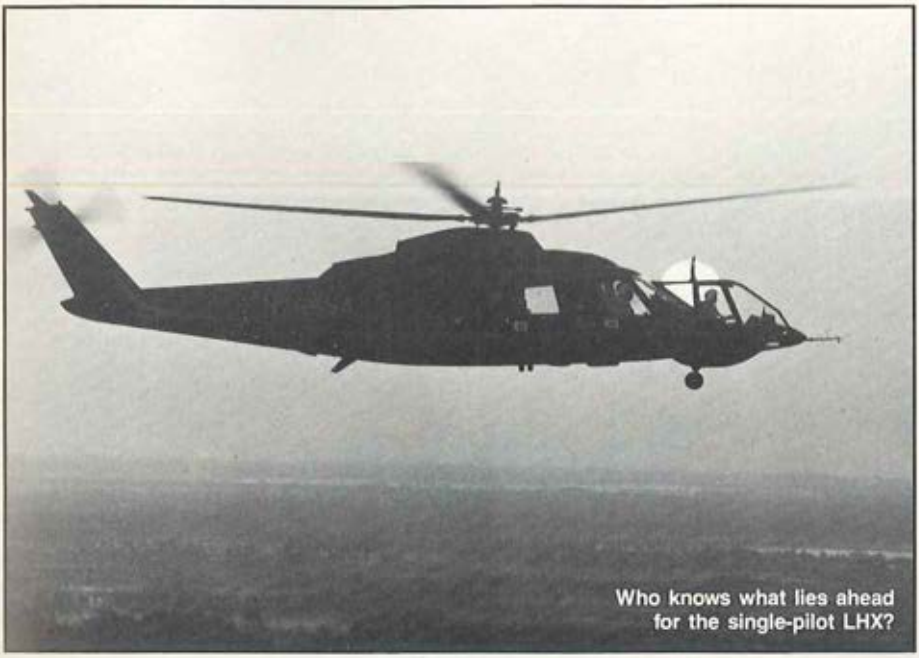
State-of-the-art target acquisition

The Aided Target Recognizer uniquely advances the state-of-the-art in target acquisition and engagement. The ATR detects, classifies, and prioritizes all types of targets for the pilot. It permits him to unmask, quickly scan the horizon for targets, and return to mask. Target images are stored and processed with the aid of the VHSIC processors. Once the pilot has returned to a masked position and activated the automatic hover-hold, he can scan the targets displayed on the helmet-mounted display, confirming those of importance and setting the priority of engagement if different from pre-set computations. When the pilot confirms the targets, he may hand them off for engagement, or he may elect to attack all targets himself, depending on the number.

Meeting the threat

The LHX is needed by today's Army to meet tomorrow's requirements. If we fail to act with great vision, the Army's light helicopter fleet will soon be outmoded and vulnerable to the increasing Soviet threat. We need the courage to reach far into the future and grasp "leap ahead" technology — technology that will provide us significant and decisive advantages on tomorrow's battlefield. That is the unique promise of the LHX program.

The foremost challenge for the aviation community is to bring the LHX program to fruition. The LHX is **the** future of Army Aviation. IIIII



Who knows what lies ahead for the single-pilot LHX?

THE THREAT.

THE RESPONSE.

LHX is the U.S. Army's answer to the enemy's growing threat. A threat our current fleet of aging light helicopters is ill-equipped to defeat.

To take LHX from concept to reality, ***Boeing Vertol*** and ***Sikorsky Aircraft*** have formed a team of companies which stand at the forefront of their respective technologies.

The Boeing Sikorsky LHX Team has already begun to apply and integrate the critical LHX technologies to create a weapon system that has the capability and flexibility to carry a single pilot into battle. And return home. The winner.

Boeing Military Airplane Company.
Total systems integration responsibility for the mission equipment package, including laboratory and flight test development.

Boeing Electronics Company.
Advanced digital, redundant flight control computer.

Boeing Simulation and Training Systems.
Aircrew institutional and sustainment training systems.

Hamilton Standard.
Advanced digital, redundant flight control computer and wide field of view helmet-mounted display system.

Harris.
Three-dimensional digital map display, super high-speed data bus, and avionics interface units.

IBM Federal Systems Division.
Aircraft survivability equipment system and very high speed integrated circuit (VHSIC)-based signal processor.

Kaiser Electronics.
Wide field of view helmet-mounted display system.

Martin Marietta.
Automatic target acquisition/recognition, and sensor fusion systems; electro-optical sensors and night vision piloting systems.

Northrop Electro-Mechanical Division.
Advanced FLIR techniques, electro-optical sensors and night vision piloting system.

Rockwell International, Collins Government Avionics Division.
Integrated communication, navigation, identification avionics (ICNIA); cockpit multifunction displays and controls; and high-speed data bus.

Sanders Associates.
Aircraft survivability equipment system.

Singer Training Systems.
Integrated aircrew training systems.

TRW Military Electronics & Avionics Division.
VHSIC-based signal and data processors, and ICNIA.

Westinghouse Defense.
VHSIC-based computers and signal processors, target acquisition/recognition, and sensor fusion systems.

BOEING SIKORSKY
THE FIRST TEAM FOR LHX

LHX: What the user needs

by GEN Carl E. Vuono

"The LHX is a must if we are to exploit our technology, apply our doctrine to the fullest, and in turn, fight outnumbered and win."

LETHAL, agile, survivable, reliable, and flexible under all terrain, time-of-day and weather conditions. These are the characteristics that the Army's future aviation forces must possess as full partners in the combined arms team.

Army Aviation is harnessing promising new technologies to enable it to fight according to AirLand Battle doctrine and lead the Army into the 21st century. The Light Helicopter Experimental (LHX) is a key initiative designed to meet the present and future aviation requirements of our combat formations.

A true combat multiplier

The helicopter has earned a prominent place on today's battlefield; it is a true combat multiplier which helps to free the commander and critical combat elements from the tyranny of the terrain and the black of the night. Among the most significant weapons advances of the 20th century, it has already very much revolutionized the face and tempo of battle even though it is still in its infancy.

As technology continues its rapid advance, vertical lift aircraft will play an increasing role in executing our doctrine in all functions of land combat: maneuver, fire support, intelligence and logistics, in addition to communications and command and control. Giant strides are being made in every technical area from propulsion and aerodynamics to survivability and sustainability.

Today's on-board visionics, avionics, and fire control systems were not even conceivable when Igor Sikorsky first hovered his fledging "copter" barely fifty years ago. The idea that such platforms would one day fire deadly missiles at targets located beyond the horizon was pure fantasy.

Today we have done all this and more; the equipment is in the hands of our troops who use it to see and fly and fight at night as well as in day.

Most importantly, we can do what every commander seeks — enhance combat power, fly more sorties with fewer aircraft and fewer personnel, and engage more targets with a smaller force. The net effect is to raise the overall warfighting capability of the unit for a given investment in force structure and total budget authority.

As an essential element of the combined arms team, Army Aviation enables us to do more across a wider spectrum of conflict. Moreover, aviation conforms to the very essence of AirLand Battle doctrine by enhancing our ability to conduct maneuver warfare throughout the battlefield in close, deep and rear operations.

Scrutinizing AOE structure

The Army of Excellence (AOE) design of aviation units, combined with the improved capabilities provided by the UH-60 and AH-64 aircraft, represents a monumental step in Army Aviation's ability to fight and survive as a member of the combined arms team. Nevertheless, the challenges of the 21st century require close and critical scrutiny of our force modernization process.

GEN Carl E. Vuono is the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC) at Ft. Monroe, Virginia.

Thus, today we must lay the foundation for the aviation systems that can usher our forces into the 21st century. Those systems must be able to support heavy, light, and special operations forces in meeting U.S. worldwide commitments across the spectrum of conflict. Above all we need systems that are truly optimized for the soldier, yet more affordable, more operationally suitable, and more survivable.

Obsolete technology

Not that the systems coming on line today do not go far to meet these criteria. They certainly do, but they are of the '60s technology, not the '80s or '90s. And many advances in materials, manufacturing techniques, and systems for refining the interface between man and machine have opened new vistas for the helicopter family. The Light Helicopter Experimental can be a springboard into the high-tech age for the Army and for aviation.

We have a real and pressing need for the LHX and its increased capabilities to replace our aging and obsolescent fleet of light helicopters. Foremost in our requirements is that this new family of aircraft be designed as a system of systems. It must be agile and capable of day and night operations under all combat conditions, requiring a blend of technology, tactics, and techniques to enhance performance and survivability.

The aviation units we develop must also be as deployable as the force they support. Since the Army is faced with worldwide contingencies, self-deployment between theaters and ease in transportability are critical to our mission.

A significant investment

We all recognize that development of an aircraft to support these needs represents a significant investment during a period of diminishing resources. Thus, the LHX must be cost-effective, both to develop and acquire and to operate and

WIDE FIELD OF VIEW HMD — The Hamilton Standard Helmet Mounted Display (HMD) — shown here at the Sikorsky Aircraft fixed-base simulator — uses two one-inch CRTs to provide high resolution video information on two precision optic devices in front of the pilot's eyes. This development article incorporates a 60-degreee vertical and 120-degree horizontal field of view.

sustain. Our studies are dedicated toward that end.

Maximizing investment

One cannot ignore total system costs; hence we must maximize our investment through innovative, effective, and efficient maintenance and training techniques. Likewise, common components between airframe configurations can produce savings in research, development, manpower, and logistical support.

We must also capitalize on our training devices to support aircrew training on the ground and in the air. Tactical and technical competency of aircrews must be sustained at the least cost.

We must maximize the returns on our training dollar investment by designing the new family of aircraft to participate at modern Advanced Collective Training Facilities such as the National Training Center (NTC) at Ft. Irwin, CA, the Joint Readiness Training Center (JRTC), and the Combat Maneuver Training Complex (CMTC) in Germany.

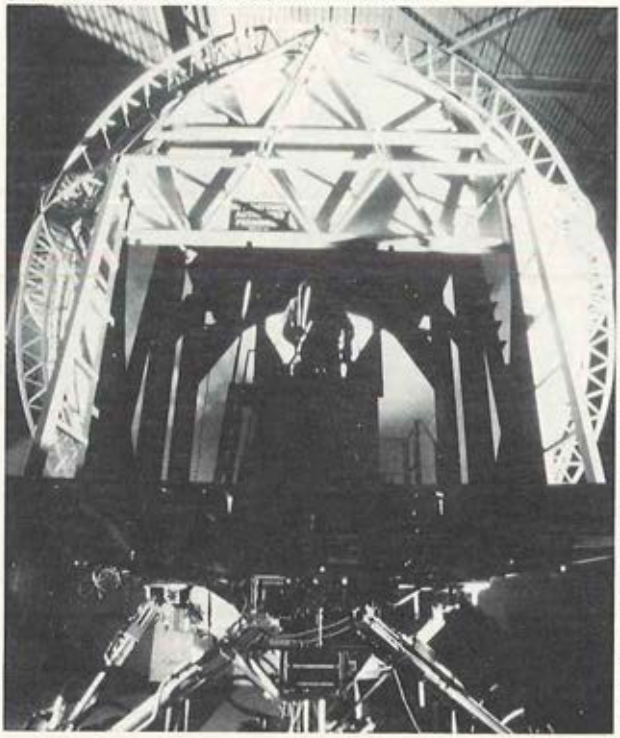
An imbedded capability

An imbedded capability to train in these environments is essential. It will provide the commander a superb opportunity to train our aviation forces to fight and survive as a fully integrated member of the combined arms team.

This is where the real payoff will come as we "prepare the Army for war." The LHX aircraft will e a welcome addition to executing AirLand Battle doctrine — both on the offense and the defense.

We at Training and Doctrine Command see many of the tactical challenges of the next century being met through the LHX family of aircraft. TRADOC and the Army Materiel Command (AMC) have worked closely since the inception of the program in 1983, and together TRADOC and AMC did the tradeoff analyses and developed the LHX required operational capability (ROC).

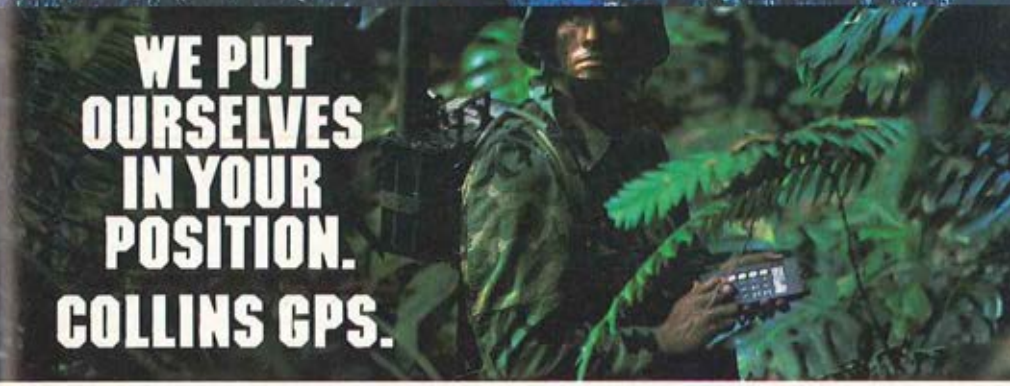
The exterior of the Boeing Sikorsky Motion-Base Simulator, located at the new Sikorsky systems integration complex at the Sikorsky plant in Stratford, CT.



Joint Working Groups

Joint Working Groups guide the LHX research and development effort and work in concert not only at the headquarters level, but at every level of combat and materiel developments. The LHX initiatives are truly a team effort and the program enjoys the highest priority at every echelon within the Army.

The Light Helicopter Experimental is a must if we are to exploit our technology, apply our doctrine to the fullest, and in turn, "fight outnumbered and win." LHX is what the user needs and the sooner we can move this program into full-scale development, the better prepared our Army will be to meet the battlefield challenges into the 21st century. IIIII



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The LHX Program Overview

by BG (P) Ronald K. Andreson

"The LHX will meet the challenge of the battlefield with an effective, single-pilot SCAT and a single-pilot operable light assault utility aircraft that is combat capable, survivable, supportable and affordable."

IN 1986, we witnessed significant progress in moving the LHX program forward. The Advanced Rotorcraft Technology Integration (ARTI) program single-pilot simulations were completed and the ARTI effort for 1987 has been expanded to demonstrate feasibility of our key technology requirements.

Competing T800 prototype engines are running in test cells with excellent preliminary results. The acquisition strategy is now solidified with the start of full-scale development scheduled for January 1988. We are starting to see some of the emerging results from the Cost and Operational Effectiveness Analysis (COEA). All of this positive activity points toward a solid future for the program.

ARTI

The focus of advanced technology development for LHX over the past few years has been concentrated in the ARTI program. In December 1983, firm-fixed price (FFP) contracts were awarded to Sikorsky Aircraft, Boeing Vertol, IBM, McDonnell Douglas Helicopter Company, and Bell Helicopter Textron, with the objective of demonstrating the technical feasibility of the single-pilot Scout-Attack (SCAT) aircraft through crew task analysis and full mission simulation of an advanced technology integrated/automated cockpit. The initial ARTI contractural effort was completed with the conduct of the single-pilot feasibility simulation demonstrations (February-May 1986) and the final contractor presentations to the Government (May-July 1986). Industry consensus is that the single-pilot LHX SCAT is technically feasible. Government assessment of the ARTI results concluded that basic tasks of aircraft flight control, navigation and communications could be effectively accomplished within acceptable workload limits of a single pilot, but additional simulation effort is required to confidently assess the workload related to night NOE pilotage, target acquisition and air-to-air engagement. During this coming year, we will concentrate on improving the fidelity of the simulation for these critical combat tasks.

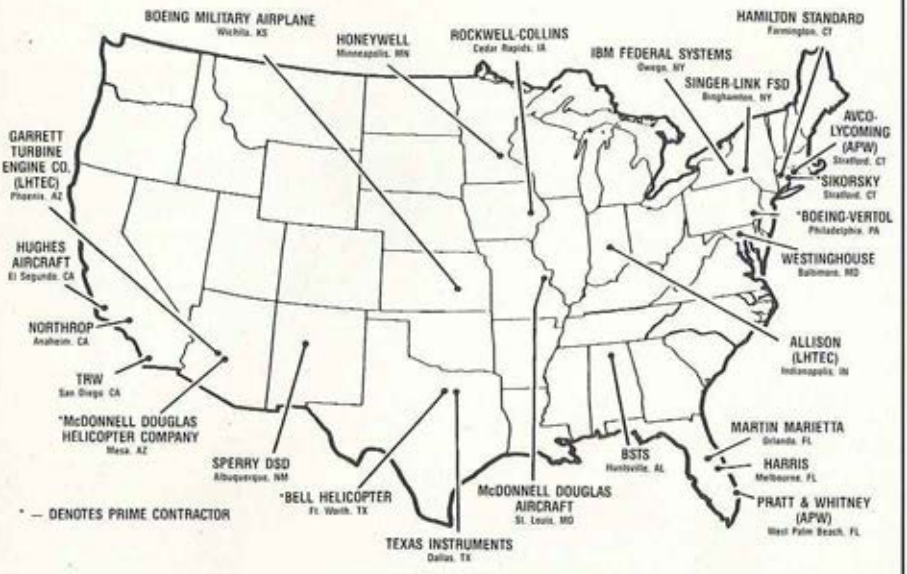
BG (P) Ronald K. Andreson is the Project Manager for the Light Helicopter Family (LHX) Program at the U.S. Army Aviation Systems Command in St. Louis, MO.

The key to fielding a highly survivable and combat-effective single-pilot SCAT is the effective integration of an advanced technology Mission Equipment Package (MEP). The LHX MEP will include Very High Speed Integrated Circuit (VHSIC) processors; state-of-the-art navigation equipment and displays; an advanced forward looking infrared (FLIR) capability; an aided target acquisition system; and a wide-field-of-view Helmet Mounted Display (HMD) that, in the aggregate, will allow effective 24 hour a day operation in adverse weather conditions.

LHX in 1987

The focus of the 1987 effort will demonstrate that the technology is sufficiently mature and can be realistically integrated into the MEP. Two equally funded firm-fixed price contracts were award-

LHX → INDUSTRY PARTICIPATION



ed in September for this effort to the Bell Helicopter/McDonnell Douglas team and the Boeing Vertol/Sikorsky team. These contracts include preliminary design and brassboard demonstration of the VHSIC mission computers, Electro-Optical Target Acquisition and Designation Systems (EOTADS) and Helmet-Mounted Display (HMD). Additionally, the contractor teams will perform tests that include scaled model wind tunnel testing incorporating airframe technologies that will enhance survivability of the system.

These efforts will serve as a logical building block of continuous, progressive, risk reduction culminating in technology demonstrations that lead to a smooth transition to Full-Scale Development start in early 1988.

The T800 Engine

The T800 engine development is eighteen months into competitive full scale development with A/PW (AVCO Lycoming and Pratt and Whitney) and LHTEC (Garrett and Allison) meeting or exceeding all major milestones in their respective schedules.

Both teams entered the full engine prototype test phase of the program with first engines to test (FETT) occuring in late summer of 1986. More prototype engines are coming on line and test hours are being accumulated at a rapid pace. The preliminary design review (PDR) on the engine components have been completed and the preliminary flight rated (PFR) designs are almost finalized. Each team will accumulate over 3,000 hours on their design before the Army selects the winner in 1988.

With the completion of the PFR designs taking place, the impact of emphasizing Reliability, Availability and Maintainability (RAM), MANPRINT and ILS upfront is readily apparent. Both teams are predicting RAM values in excess of

"The battlefield." Few of today's Aviation Soldiers have been there. And not many have experienced the awesome threat nor the split-second decision making that will be tomorrow's clash of advanced, lethal technologies. Our LHX crews must be ready . . . as ready as combat veterans.

As we build the next generation of Army helicopters, we must concurrently train the next generation of Aviation Soldiers. Train and sustain them to get the utmost from themselves and their weapon systems. The soldiers and the machines must be the very best. The training system that blends them into a cohesive fighting unit must also be the very best.

"Training, the Army's principal activity in peacetime, is intended to raise individual and unit proficiency to levels necessary for mission accomplishment."

General E.C. Meyer
Former Chief of Staff
U.S. Army

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THE FIRST TEAM FOR LHX TRAINING

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The First Team's broad experience in military aviation training provides LHX with an integrated approach that appreciates the soldier's mission, comprehends MANPRINT, and produces the high quality training required for mission ready aircrews.

The Army will provide the soldiers. The First Team will build the machines. And the First Team for Training is ready to meet the training challenge for LHX into the next century.

Fully Integrated Aviator and Maintenance Training for LHX

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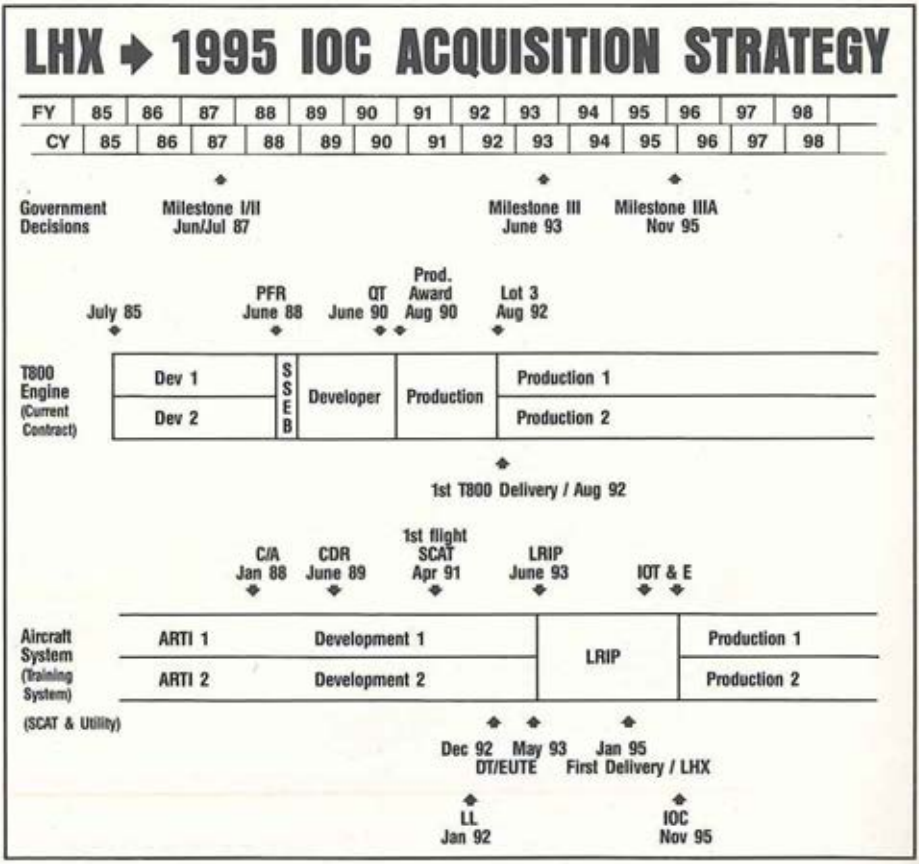
THE FIRST TEAM FOR LHX



their guarantees; the number of tools required for unit maintenance is less than any other turbine engine in the Army inventory; depot level special tools are fewer than the program goals; and removal time requirements for engine line replaceable units (LRU) are well under original objectives.

The metric engine

Incorporation of metric design has been less complicated than projected. The metrication of the engine is without any major hitches and being implemented at a cost far below the gloomy predictions of the pre-RFP days. Vendors and suppliers are cooperating and generally embracing because they see a broader marketplace for their metric products. The number of vendors qualified to produce engine components is increasing at a rapid pace. Both teams are aggressively pursuing new vendors and suppliers.

Emphasis is being placed on increasing participation by small and minority/women owned businesses in the program. Competition goals are being exceeded. There has been a spillover effect in that some new vendors have so impressed the prime contractors that they are being qualified to produce parts for existing engine lines.

Acquisition strategy

Competition remains the central focus of the LHX acquisition strategy for both development

and production. Competition is planned throughout the aircraft system development program culminating in a full prototype fly-off prior to a production design. Competition is key to achieving an affordable LHX in 1995. It is evident that the large base of industry participation will provide a solid competitive environment for the program.

The aircraft fly-off will occur during the Government Development Test/Early User Test and Experimentation (DT/EUT&E) using six of the seven prototypes each industry team will build. During this same period, the LHX training systems will also be evaluated as a part of the overall source selection process.

In the Low Rate Initial Production (LRIP) phase, the winning contractor team will expand their "hard tooling prototype" production lines and produce about 72 aircraft. Several SCATs from the first production lot and the upgraded prototypes will be used by OTEA during Initial Operational Test and Evaluation (IOT&E). This will allow us to operationally test early production versions of the aircraft and training system before approving full production, which begins at the conclusion of IOT&E. Beginning with production lot three, the separate prime contractors of the winning team will split apart to compete for subsequent production quantities.

Thank You!

The staff of *Army Aviation* would like to thank **BG (P) Ronald K. Andreson,** LHX Program Manager, for his help in coordinating the content of the LHX portion of this issue. We would also like to thank **LTC Jack Magrosky** of the LHX-PMO for his work in assembling the articles and handling the day-to-day chores on the Army end. Finally, we would like to thank **MAJ Don Burke**, whose help at the NAVPRO office at Sikorsky-UTC here at the Connecticut end made it possible to give you the latest information on this constantly evolving aircraft program.

Next month's issue will contain a number of follow-on articles on LHX, including a reports on the T800 engine program status, the RAM/ILS effort on LHX, and the "metrication" (the use of metrics) of the Army's newest aircraft.

ABOVE: Simulators, such as this CompuScene IV, developed by G.E. Simulation for the McDonnell Douglas-Bell "SUPERTEAM", will provide state-of-the-art simulated combat scenarios for the future LHX pilot.

The Army's light fleet of helicopters is tactically obsolete to counter the looming threat. Modification and technology upgrade of these aircraft do not provide the solution. The LHX will meet the challenge of the battlefield with an effective single-pilot SCAT and a single-pilot operable light assault-utility aircraft that is combat capable, survivable, supportable, and affordable. It will fight effectively in air-to-air as well as air-to-ground roles on the battlefield of the 21st century.

Army Aviation is moving toward a new dimension with the LHX. Sound business sense decisions coupled with a cooperative "team" effort between the Government and Industry should ensure that a major leap forward in tactical capability is achieved with the LHX program. IIIII

The LHX impact on Force Structure

by MG John W. Woodmansee, Jr.

IN addition to the requirement for increased combat effectiveness, the LHX program has had, from its inception, two additional major goals: a reduction in manpower requirements and a substantial decrease in operation and support (O&S) costs. With the Army's constrained budget projections, and the mandated reductions in officer and warrant officer strength facing us, these goals have literally become mandatory requirements.

Force structure implications are critical because the LHX is more than a replacement for AH-1s, OH-58s, OH-6s, and UH-1s in our light forces. Budgetary cutbacks in AH-64, UH-60 and OH58-D AHIP production will cause voids in both heavy and light (AH-1/OH-58) forces. The LHX will have to fill these voids. The potential requirement for LHX-SCAT aircraft could therefore rise from the current estimates (for light forces only) to over 5,000 aircraft for the entire force.

Meeting O&S goals

To meet the O&S cost reduction goals, the LHX program will stress the importance of reliability, availability and maintainability (RAM). This means an LHX fleet can generate more sorties than either our COBRA or APACHE forces. The extensive use of prognostics and integrated diagnostics will allow commanders to know aircraft status before, during, and after each mission. This translates into more available combat power with less people, smaller inventories of repair parts, and less maintenance manhours per flight hour. Because of these RAM capabilities the LHX can be maintained by almost a third fewer personnel than ever utilized for an Army Aviation system. The linkage between RAM benefits and increased combat effectiveness is a specific field of inquiry in our fleet analysis being performed by the Army's Concepts Analysis Agency.

MG John W. Woodmansee, Jr. is the Assistant Deputy Chief of Staff for Operations for Force Development, HQDA, Washington, D.C.

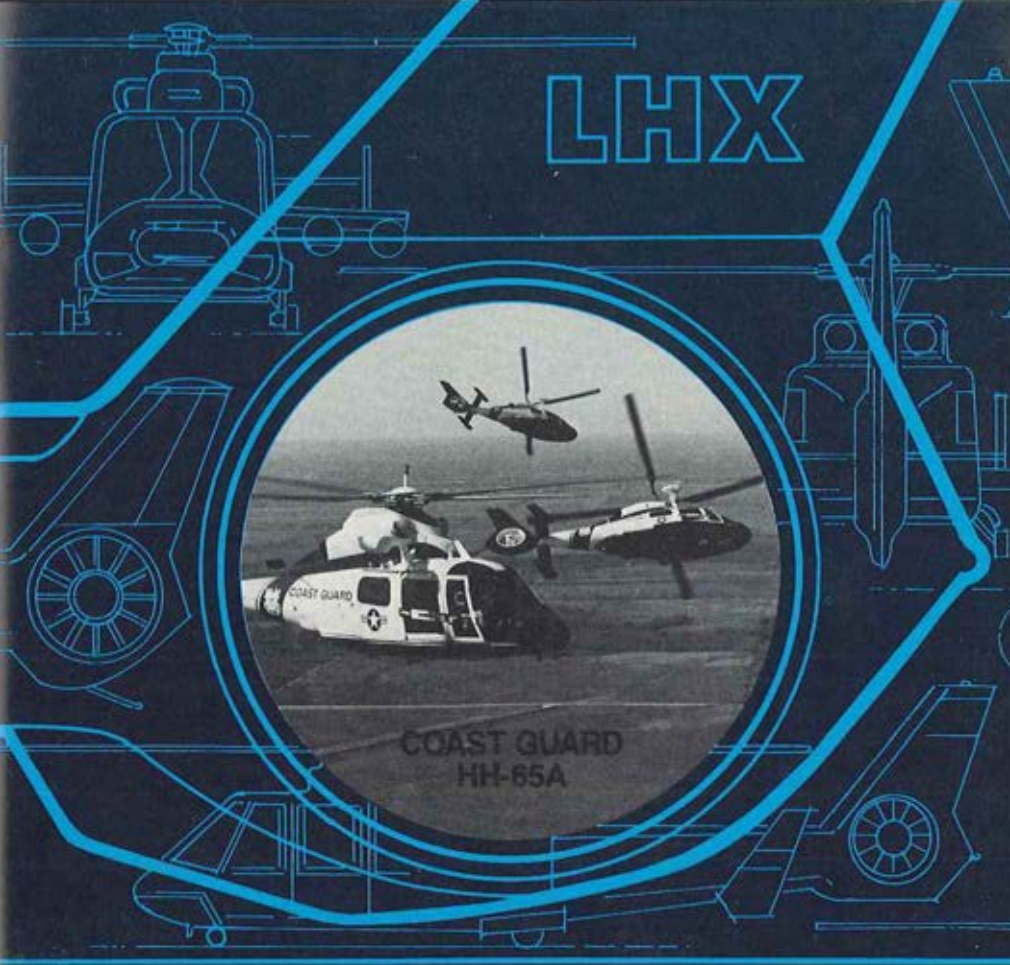
The LHX will clearly be capable of flying more sorties in a 24-hour period than the "lean" pilot-to-cockpit ratio provided for in our unit authorizations. The issue of the Scout/Attack (SCAT) LHX being a single-pilot or two-man aircraft is, therefore, a key issue.

The single-pilot goal

Our goal, from the start, has been to design the SCAT around a single crew member. This is a bold step and one not taken lightly. Our combined arms forces must operate effectively in adverse weather, day, night, and around the clock. The current force structure is not designed to operate 24 hours a day with available aircraft. After seeing and flying in the ARTI simulators, most of us are pleased by the great steps we've seen industry take in simplifying the pilot workload tasks. We must, however, make sure that these innovations can stand the test of battlefield conditions. Therefore the Army has taken the position that both single pilot and two-crewmember versions be prototyped.

If LHX is successful as a one-man aircraft, and if we can keep two pilots in our force structure, our commanders will have two crews to fight continuously on the battlefield with equal day and night effectiveness. If we don't keep both pilots in our organization, we will surely need help from our reserve component aviation force structure to provide increased manning for our LHX units to under combat conditions.

The Cost and Operational Effectiveness Analysis (COEA), under way at the Army Avia-



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tion Center, is analyzing various unit organization sizes for LHX. As an example, the seven AH-1/four OH-58 attack company mix is being compared in one case to an LHX company of eight ships. This rationale was previously used with introduction of AH-64 and UH-60 aircraft. We replaced 21 AH-1s in the attack helicopter battalions with 18 AH-64s. The 23 UH-1s in the assault helicopter companies were replaced with 15 UH-60 aircraft because that fleet provided the same lift capability. If fewer aircraft can do the same job, a significant overall cost saving will be achieved while retaining the same company and battalion force structure.

Greater productivity

Our initial COEA findings show equal or greater effectiveness and productivity over the AH-1, UH-1, and OH-58 fleets at a ratio of eight LHX vs. 11 in attack/scout companies and 11 for 15 in Utility/Assault units. Medevac replacement will continue on a one for one planning basis until that portion of the analysis is completed.

There is an immense amount of work yet to be done before we settle on our tactical and organizational specifics. But one thing is clear! The LHX will provide the commander with a more lethal, versatile aircraft system that has higher availability and is easier to maintain and operate.

These words are easy to write but I can assure you the whole user/developer community is committed to achieving these goals. LHX has attributes that give us a clearer insight into the future, and I am convinced those attributes will enable us to win on the battlefield of the late 1990's and early 21st century. IIIII

MOTION-BASE SIMULATOR — The new six degree of freedom motion-base simulator at Sikorsky aircraft is being used by the Boeing Sikorsky team to assist in the LHX design. The simulator can create day, night, and dusk lighting, as well as all weather conditions. A variety of aerial and land-based vehicles can be introduced, singly or in groups, to study pilot response to almost any combat situation.

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The LHX Support concept

by Joseph P. Cribbins

IN the June 1985 issue of *Army Aviation*, I wrote on "LHX Sustainability (RAM/ILS)". In that article, the principal thrust was toward Reliability, Availability, Maintainability (RAM), and Integrated Logistic Support (ILS) to be designed and produced in the LHX. The result will be Inherent Availability (Ai) in the aircraft as a total weapons system. As a follow-up we must look at the LHX Support Concept designed to preserve Ai and maximize Operational Availability (Ao) when the LHX is fielded. With new, innovative support concepts now being developed for the LHX, we will have an unequalled opportunity to accomplish this.

Two-level maintenance study

In 1985, the U.S. Army Aviation Logistics School (USAALS) established a study group with members from various parts of the Army Aviation community. The group conducted a two-level maintenance study with the goal of reducing Operating & Support (O&S) costs while retaining and sustaining all the characteristics of Safety, Reliability, Maintainability, and Readiness incorporated into Ai for the LHX. Phase I of this study which covers LHX has been completed. Phase II will look into feasability of extending two-level maintenance — in whole or in part — to other aircraft systems.

The USAALS study group defined the two-level Maintenance Concept as being "in concert with the Army of Excellence force structure and consisting of two task levels — aviation user and depot maintenance. The user will perform on-aircraft maintenance tasks only and not perform maintenance in support of the supply system. The supply system will be consistent with current supply procedures to support user maintenance. The user level will be structured to perform maintenance which will include on-site repairs, combat maintenance/battle damage assessment and repair (CM/BDAR), maintenance of float aircraft, diagnostics and prognostics, and surge maintenance. Depot level maintenance will be structured to perform all maintenance in support of the supply system and those extensive on-aircraft repairs beyond the capability of the user."

Joseph P. Cribbins is the Special Assistant to the Deputy Chief of Staff for Logistics and Chief of the Aviation Logistics Office, HQDA.

Maintaining the best

LHX will be more reliable/maintainable than any aircraft developed to date — hence will have reduced supply and maintenance requirements. With increased reliability comes a reduction in maintenance man hours, maintenance people, and the overall supply of spare and repair parts.

The Mission Equipment Package (MEP) needed to meet many and diverse LHX missions (Scout, Attack, Assault, Utility, Command and Control, Medical), will be more complex than any MEP fielded to date. This dictates diagnostic/prognostic systems that can not only tell what component has failed, but can forecast when one is about to fail. This also dictates having people with skill levels in electronic maintenance vs. mechanical maintenance — a new breed of maintainers for Army Aviation.

The "Apple Orchard" maintenance concepts of fixing and maintaining components/LRU's forward at user level will be greatly changed. Diagnose? Yes! Prognose? Yes! Aircraft Maintenance? Yes! Remove and Replace? Yes! Repair at user level when removed and in support of the supply system? — No!

All the aforementioned will drive a requirement

to have a highly responsive supply system.

First will be the two-level maintenance concept. As an overall concept, the two-levels will involve user maintenance and depot maintenance. User maintenance will be all that maintenance accomplished at division level and below and for those separate aviation units that are of division size or less.

When we established the three-level maintenance concept, we incorporated 60-70% of direct support maintenance into unit maintenance (AVUM). We must now decide how much we need to incorporate of what is now intermediate maintenance into user maintenance to assure that we retain the capability to sustain mission readiness. The second level of maintenance will incorporate the remainder of what is now intermediate level maintenance and all of what is now depot maintenance.

Importantly, depot maintenance should not be construed as being restricted to a CONUS organic or contractor's facility and must of necessity be performed where needed and where this can be done. Further, and probably most controversial will be "who's in charge?"

Deciding who's in charge

We must make a top level stab at this. We may come to the realization that for a two-level concept the only practicable entity in charge of the depot level will be the AMC complex which has all the marbles (research, development, production, spares/repair parts, and depot level people, skills, overhaul, and maintenance programs). If we can agree on that, then we can move into the specifics of how on-aircraft maintenance will be accomplished at the user level.

This will encompass diagnostics and prognostics which will allow us to have removal and replacement maintenance accomplished by the critically needed Technical Inspector (TI) and crew chief. They will be backed up by a reduced number of people, cross-trained where needed and feasible, supplemented by mini-depots contiguous to the user; these could be organic or contract. As shown above, the requirements and capabilities of maintenance really drive supply. Obviously, if maintenance is not required, then there is little or no requirement for supply.

Two-levels of maintenance can only exist with a highly responsive supply system to rapidly have available those items that are removed and replaced under the two-level of maintenance concept. This would dictate a third level of supply of spare/repair parts consisting principally of engines, components, and LRU's backed up by the bits, pieces, and repair parts needed when these items are replaced.

The PLL (Prescribed Load List) at user level must consist of those bit and piece repair parts needed to rapidly remove and replace and be restricted to rapidly moving components for which there is a constant demand. All items not contained in the PLL at user level or the ASI at the intermediate supply level will be provided from depot stocks or overhaul/production.

The people challenge

• To me, the most important people in aviation maintenance are the crew chief and the Technical Inspector (TI).

• The crew chief is that one person most knowledgeable of his LHX aircraft by serial number, probably by name (as has been done with aircraft in the past); of its individual characteristics, (and aircraft do have them); of what it takes to keep that aircraft operating safely and reliably.

In 1981, when we completed the evaluation of Career Management Field (CMF) 67, we briefed then Vice Chief of Staff of the Army John W. Vessey, Jr.. At that time he said that if he had his druthers he would assign (I think he actually used the word "chain", rather than assign, for emphasis) a crew chief to one aircraft by serial number throughout his/her career. He also said that this would not work without appropriate career progression and the wherewithal to incentivize/motivate in order to make such assignment attractive.

• The TI is the master diagnostician of Army Aviation; the one person most knowledgeable in marrying up aircraft system problems with the support system; the one person completely trained and dedicated to keeping safe, reliable, maintainable, and operationally ready aircraft at user level. He must be selected with — appropriate aptitudes; be properly trained; utilized in his primary skills; and we must incentivize and motivate toward retention in the Army in the MOS 66 career field.

• Training and utilization in primary skills are a must. The crew chief must be trained as a crew

(LHX Support — Continued on Page 79)

Defense Science Board impact on the LHX

by LTG Louis C. Wagner, Jr.

IN the development cycle of complex, costly weapons systems there are almost unlimited opportunities for choices, trades, and decisions. Even a cursory study of large complex organizations such as the Army shows that it is unlikely that a consensus in a pluralistic organization can be reached quickly, especially a decision involving a large, ambitious program like LHX. The addition of other interest groups such as the Office of the Secretary of Defense (OSD), the Congress and various contractors further complicates the situation. Sooner or later it is advisable to call in a body of knowledgeable, experienced managers from government and industry to help sort out the issues. When this is done at OSD's initiative, that group is usually the Defense Science Board (DSB).

Asking tough questions

While in academic terminology this is yet another "interest group", the DSB traditionally has maintained a broad non-parochial base.

In December 1985 a DSB task force was formed at the direction of the Under Secretary of Defense for Research and Engineering (USDRE), Dr. Donald A. Hicks, to examine LHX requirements. As a minimum, he asked that the following items be addressed:

1. Are the system performance requirements adequate and appropriate for the aircraft's missions and purposes? Are they flexible enough to allow tradeoffs between cost, schedule and performance requirements?

2. Are the CINCs involved in the development of the requirement? Has there been proper "iterative review" between the user, the R&D community, the developers and industry?

3. Has the cost effectiveness of each requirement been addressed at the margin so as to avoid small potential increases in performance driving costs upward past the point of economic return? Have early tradeoffs been accomplished to assure performance requirements are not overstated or under costed?

4. Are technological risks identified and recognized in schedule length and availability of resources? Is there planning for growth to include preplanned product improvements?

5. Is the projected threat reasonable? Does it include a projection of future enemy aircraft and ground weapon system countermeasures?

6. Are reliability, availability and maintainability requirements adequately stated so as to drive the maintenance burden below those of current systems to be replaced, with appropriate reductions in life cycle cost of ownership?

7. Will maintaining full scale development schedule be a dominant program goal with contractual incentives for doing so?

LTG Louis C. Wagner, Jr. is the Deputy Chief of Staff for Research, Development and Acquisition at the Department of the Army in Washington, D.C.

How the Board worked

Robert L. Everett, the Chief Executive Officer of the Mitre Corporation, served as Chairman of the task force. The members included, among others, three retired four-star officers, a former Under Secretary of Defense, the current Executive Director of the American Helicopter Society, and a former Director of Defense PA&E.

The members were provided study packages in December 1985. The first meeting was in January, with two days of overview briefings, following which the task force requested specific briefings on subjects they felt impacted the LHX requirement. The group met approximately every

four weeks through July 1986. Throughout this period Mr. Everett afforded the Army the opportunity to influence the agenda and to bring in whatever information thought necessary to explain the program. A typical meeting was two days of briefings and discussions concluding with an executive session to assess the information and establish direction for the next meeting. Briefers were usually from the LHX Program Office (BG Ronald K. Andreson, PM-LHX), and from Ft. Rucker (MG Ellis D. Parker, CG-USAAVNC and COL Frank H. Mayer, Director of Combat Developments), although the Under Secretary of the Army, the Vice Chief of Staff and one Congressional staffer also made presentations. The members of the task force also briefed their associates, when their special background was relevant to an area under consideration.

The Recommendations

After delving into every nook and cranny of the LHX program the task force reported on six conclusions and recommendations. Of these, five were areas that the Army wholeheartedly embraced, having already decided to implement changes similar to those recommended.

Recommendation 1 — The Army should firmly commit itself to acquiring a new fleet to replace its current light helicopter inventory. However, the Task Force believes that a truly realistic approach to the design of such a fleet is unlikely to be achieved as long as there is widespread belief in the Army that the LHX program will not be approved unless a set of stringent goals can be met, or at least until everyone agrees they can be met whether they believe so or not. This situation should be turned around, so that the participants are motivated by the need to design an optimum capability rather than the need to sell a fixed approach. The question to be addressed is not whether a new aircraft or fleet should be developed, but what characteristics it should have to be useful, implementable, and affordable.

Recommendation 2 — The Army should restate its goals as desired bands of performance with minimum acceptable limits and priorities.

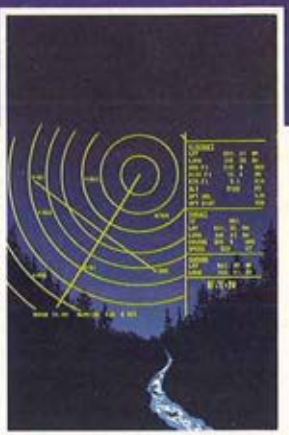
Recommendation 3 — The competition should include the construction of testable prototypes, carried to the point that critical program decisions can be based on them. Preferably, these prototypes should be of full systems, because of the complex nature of the LHX's mission equipment/avionics and their integration needs — both among themselves and with the air vehicle, weapons, and new operating doctrine that they will permit. But at least they should cover selected, higher-risk items in various functional combinations. Contractors should be allowed to propose prototypes of an advanced concept nature if they want to, including tilt-rotor possibilities, rather than being required to offer only conventional helicopters. The Army should also continue to encourage the modification of present air vehicle platforms, in order to prove out in principle state-of-the-art concepts.

Recommendation 4 — The Army should make every effort, with active OSD support, to assure the full and continuous funding of the AR-TI program until the higher level technical uncertainties have been eliminated from the program. It should also continue to fund and evaluate mockups of the one vs. two crewmen cockpits as a matter of special importance until a firm choice between the two can be made. The Army should also separate out of the initial LHX program for separate pre-planned product improvement (P^3I) treatment those technological efforts such as helmet-mounted displays, image processing, and the signal processing related to multi-sensor fusion whose art is advancing rapidly and which are applicable to more than the LHX program or even to all of Army Aviation.

Recommendation 5 — The Army should appoint a Surrogate Chief Executive Officer (SCEO) for the LHX program and delegate to him the Army's authority and responsibility for the program. The Army should also establish a streamlined communications channel between the SCEO and the LHX Program Manager to deal with program tradeoffs, which the Program Manager is encouraged to propose (especially those tradeoffs for which the Government alone is responsible, such as trading off performance for schedule or risk for cost), and other programmatic matters deemed to be within the decision purview of the SCEO.

Recommendation 6 — The Army should assign someone with adequate time and resources the task of managing the continuing process of modernizing the Army's rotary wing fleet, or even, perhaps, all of its aviation inventory. One way of doing this would be to expand the duties of the SCEO for the LHX, an approach which the Task Force supports.

LHX ASE



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Specifically, the Task Force recommends that:

(a) the Army appoint an SCEO for all Army rotary wing aircraft and have reporting to him for appropriate matters the PMs for all such aircraft and related programs. The location of this SCEO in the Army organization is secondary to the authority assigned him by the Army and OSD.

(b) the Army plan for a realistic budget level for rotary wing development, procurement, and update over a period of years, and assign to the SCEO the responsibility for planning and carrying out the activities necessary for replacing and improving the Army fleet.

(c) the SCEO organize a development process that will provide a continuous stream of new technology and devices that can be applied to vehicles in existence and in production as well as to those in development. He should also maintain suitable production lines and production capabilities, in order to allow continual choices for future buys and thus assure continued competition among suppliers.

He should consider and, when desirable, buy commercial vehicles. He should plan for long-term developments, acquisitions, and logistic support, including reliability, maintainability, training, exercising, simulation, and evaluation. In sum, he should be responsible for the Army's entire rotary wing capability over the long haul.

A question of goals

The Army strongly agreed that we must modernize the light fleet, but the question of goals was more difficult. Everyone agreed that they had served well to limit growth in cost and weight, and that we must continue to strive for single pilot capability. But, the time had come when the goals either required adjustment or should be abandoned. With proper adjustment they could continue to serve as program constraints. Without adjustment they would soon be ignored or drive up the cost in an attempt to meet some which were too optimistic. The Army, through a rigorous review process over a four-month period made the adjustments shown in the chart below.

The Army's original program for LHX encompassed full competition concluding with a competitive flyoff. This competition was truncated in the FY 1985 budget process due to a shortage of funds. The DSB study supported the Army in going back to OSD to seek restoration of the funds in the POM-to-Budget cycle for FY 1988.

LHX → STATUS OF PROGRAM GOALS

	GOAL	CURRENT	ADJUSTED GOAL
• SCAT Primary Mission Weight (Lbs.)	8,000 (±500)	8,940	9,000 (±500)
• Flyaway Cost (FY 84 - $ Millions)	6.0 (SCAT) 4.0 (Utility) 5.3 (Average)	6.9 4.8 5.7	7.0 5.0 5.9
• Combat Capability & Survivability	Significant Improvement	Significant Improvement	No Change
• Single Pilot	Yes	Probable	No Change
• Commonality	Yes	Yes	No Change
• O & S Cost Savings (% vs. Current Fleet)	40-50%	20-25%	20-30%

passed full competition concluding with a competitive flyoff. This competition was truncated in the FY 1985 budget process due to a shortage of funds. The DSB study supported the Army in going back to OSD to seek restoration of the funds in the POM-to-Budget cycle for FY 1988. The current development program now has full competition, with possible down-selection at three times: Critical Design Review, after the first flight of the aircraft and following government competitive tests. The Army agreed with the conclusions that led to recommendation 4, but could not totally accept the DSB's solution. It was decided to continue risk reduction efforts similar to what had been the ARTI program. But, since ARTI was defined as Concept Development work with 6.3b funding, the Army decided to do the same work recommended by the DSB within the 6.4 (Full Scale Development) line, and keep the work aligned with the rest of the LHX effort.

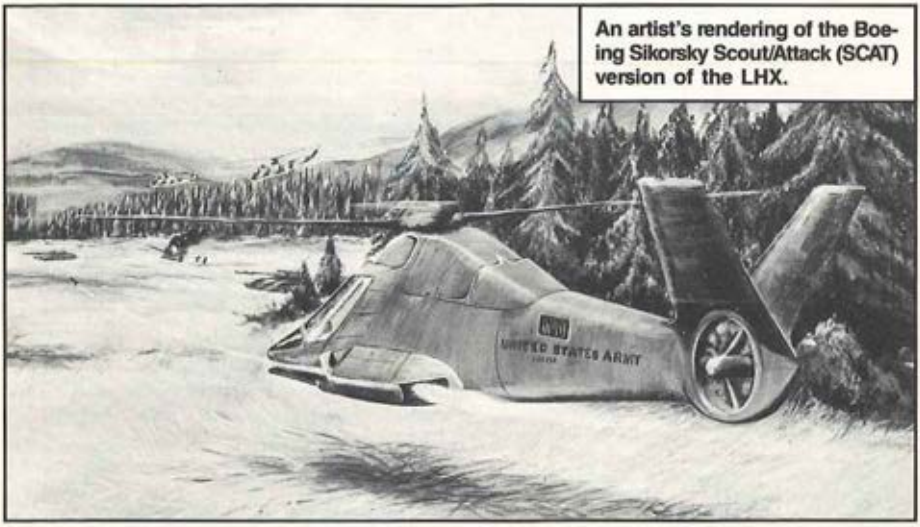
A Program Executive Officer

Recommendations 5 and 6 relate to the Army's structure for managing LHX as well as other major systems. These recommendations will be implemented as a result of the Defense Reorganization Act, and while it is too early to predict the specific outcome, we can say that the Surrogate Chief Executive Officer idea will be implemented as a PEO, or Program Executive Officer. As currently being considered he will have program authority over LHX and probably other attack fleet systems as well. The final organization of PEOs will result from ongoing studies.

In addition to the six conclusions and recommendations presented in their report, the DSB discussed other concerns. The Army has taken these concerns seriously and is studying them, both in the Cost and Operational Effectiveness Analysis for LHX, and at HQDA. These concerns include the question of speed requirements for the more distant future, the advisability of building utility and scout/attack systems with common components, the use of present generation weaponry against future threats, and all the arguments that surround the question of crew size and make-up. It is too early to guess the outcome of the analyses that answer these concerns, but it can be said that the DSB task force brought focus to the issues.

Accepting the recommendations

The DSB offered their recommendations "in the spirit of hoping to evoke an Army reaction which will be useful not only on the immediate LHX program — but also on other DOD programs ..." The Army has accepted them in that spirit, and has found them to be helpful. LHX is a healthier program for having been through the DSB process. IIIII



An artist's rendering of the Boeing Sikorsky Scout/Attack (SCAT) version of the LHX.

Tactical employment of the LHX

by MG Ellis D. Parker

THE light helicopter experimental (LHX) represents the most dramatic improvement in Army Aviation's ability to destroy enemy armor since the introduction of the helicopter on the battlefield. For the first time, the attack helicopter will be a complete fighting vehicle, which is able to perform both attack and scouting functions. Speed, agility, enhanced target acquisition, and firepower capability make the LHX an extremely lethal and efficient fighting system.

Attack helicopter units which are equipped with this aircraft will demonstrate an unprecedented ability to increase the tempo of operations to a degree sufficient to help offset enemy numerical advantages. Radical expansion of the battlefield, which is created by massive enemy concentrations and technological advances, demands the introduction of combat systems that can give significant advantages in agility over the Threat.

The answer to the challenge

The LHX is Army Aviation's answer to this challenge. Its inherent speed and mobility will allow commanders to influence the entire battlefield throughout the full spectrum of deep, close-in, and rear operations. In conjunction with other maneuver and combat support elements, LHX-equipped units will assist in collapsing the enemy's will to fight by providing assets that can rapidly mass combat power against Threat weak points at critical times and places.

Employment of attack assets with this new machine will still follow the basic doctrinal tenets as outlined in FM 100-5, **Operations,** dated May 1986; but the operational techniques associated with fighting these units in future battlefields may display significant modifications to currently accepted practices. On board state-of-the-art technological advances will allow commanders to accomplish their missions with increased efficiency and with decreased risks to aircraft and crews.

For example, attack company commanders can experiment to find the best routes into objective areas by using the aircraft's digitized map to identify locations that are vulnerable to enemy line-of-sight weapons systems. This same feature allows leaders to select battle positions and firing positions that provide greater protection from enemy observation and fires while still affording excellent standoff engagement ranges. Additionally, the units' operations order and its associated graphics can be preloaded into each aircraft's data disk for storage in its computer memory.

Finding the best "mix"

The Directorate of Combat Developments, along with other agencies at Ft. Rucker, has been endeavoring to determine the best task organizations for employing LHX-equipped units. Various "mixes" have been studied to test tactical operations in simulated combat, using computer models such as Janus and Carmonette. These studies continue today under the superv ision of the TRADOC Analysis Center at White Sands Missile Range, NM. The most common company-level unit tested is composed of eight scout/attack (SCAT) helicopters. The company is further divided into two platoons: a "light" platoon of three SCATs and a "heavy" platoon of four SCATs. The remaining aircraft is flown by the unit commander. All SCATs are identically equipped, but may be loaded with different varieties of munitions based on mission, enemy, time and troops available (METT-T) and the commander's intent.

MG Ellis D. Parker is the Commanding General of the U.S. Army Aviation Center and Ft. Rucker, AL and the Aviation Branch Chief.

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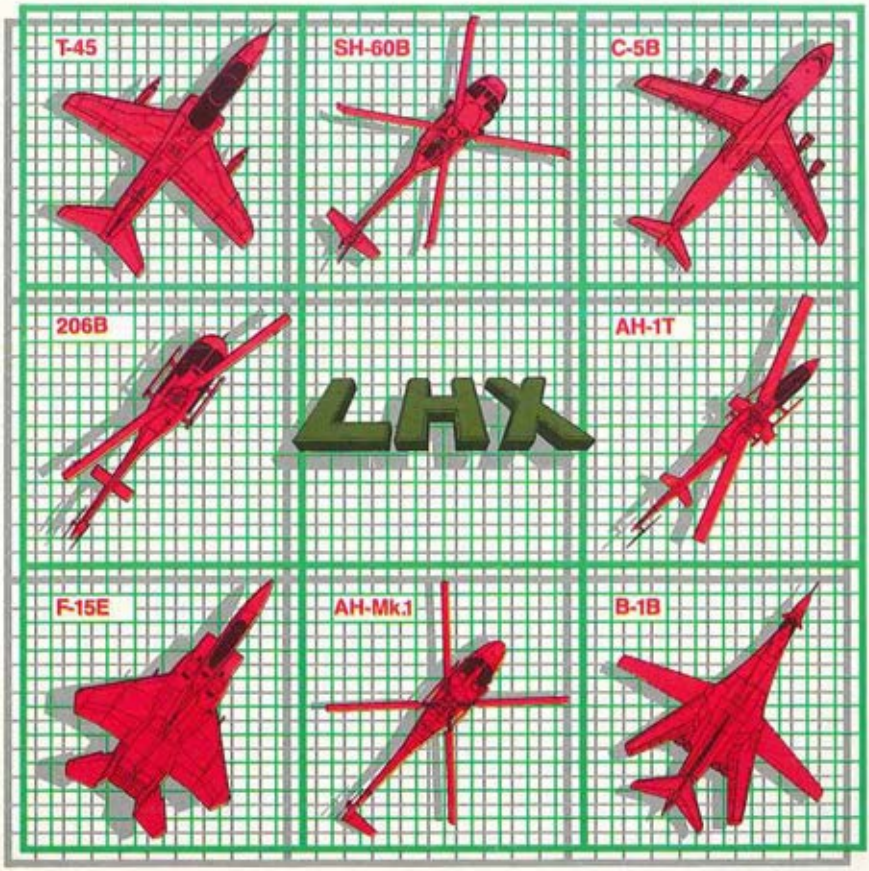


In computer wargaming scenarios tested to date, unit commanders frequently position the bulk of their forces into holding areas and then continue on their leader's reconnaissance of battle positions and engagement areas. The information obtained from this reconnaissance is analyzed by the commanders and forwarded to the other SCATs via data burst transmissions. All participants in the mission then can update their graphics to reflect the most current and accurate situation and control measure.

Identifying the threat

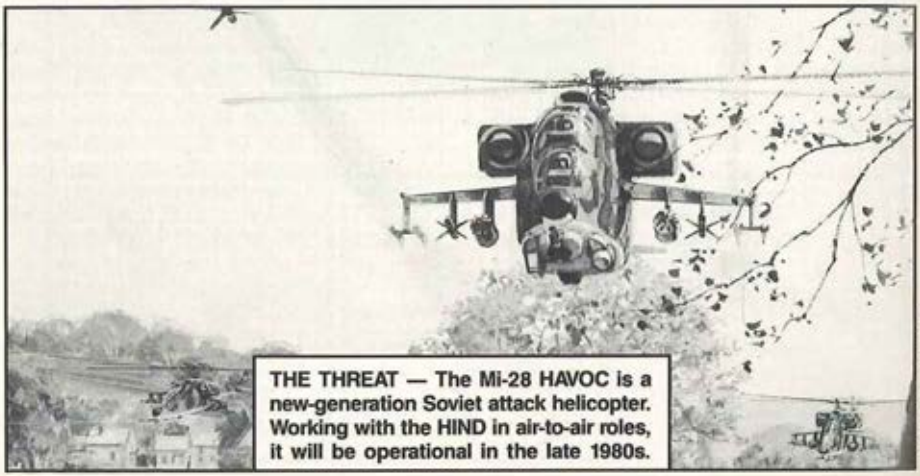
Aircraft operating in the scout mode take advantage of the LHX's aided target recognition system to assist them in identifying Threat vehicles and Threat emplacements. This system greatly reduces exposure time by accurately scanning the battlefield at rates far faster than visually possible, even with stabilized optics. The pilot merely unmasks from his covered position; and a prioritized listing of targets is presented for confirmation. Also, a radio frequency interferometer (RFI) will record and store information on the Direction of Threat-emitting radars. This data is burst-transmitted to the commander so that he can reprioritize targets for destruction. In addition to decreased exposure to Threat, the resulting benefits of the LHX's target acquisition system include decreased target engagement timelines, and improved target selectivity.

The company is moved from the holding area into its designated battle positions. Since all aircraft have updated graphics displayed in their cockpits, pilots simply maneuver into their preselected firing positions and await fire commands. The company commander moves to a location where he can "see the battle" well enough to make command and control decisions, to coordinate artillery and close air support, and to communicate with the battalion commander.

Sharing the combat tasks

Platoon leaders relay attack orders, conduct target handovers as required, and orchestrate local security efforts. Since all aircraft are similarly armed and equipped, anyone can equally share combat or security tasks. Laser designated HELLFIRE missiles allow aircraft to engage targets from either direct or indirect firing positions. All of the advanced technological systems, coupled with the extremely agile flight characteristics of this new airframe, exhibit survivability potential heretofore unrecognized.

Fielding the LHX into attack helicopter units at both division and corps will assist commanders in seizing the initiative during defensive operations, and will assist them in retaining it during offensive operations. Increased survivability afforded by the LHX's technological advances and maneuverability will aid in weighting risk versus payoff to our advantage during mission analyses. This provides a more "windows of opportunity" to strike the enemy in depth at times and places of our choosing. When one considers the LHX's contribution to combined arms efforts on the Air-Land battlefield, he immediately sees an increased capability to fight outnumbered and win.IIIII



THE THREAT — The Mi-28 HAVOC is a new-generation Soviet attack helicopter. Working with the HIND in air-to-air roles, it will be operational in the late 1980s.

Courtesy of Hughes Aircraft Co.

Early User Test & Experimentation with the LHX

by MG James E. Drummond

"As with everything else in the LHX Program, the operational test and evaluation effort is anything but business as usual. . . "

THE 21 January 1986 publication of AR 71-3, User Testing, deleted the traditional terminology used to describe user test and evaluation activity. Testing conducted to assess the operational effectiveness and suitability of military materiel prior to a full production decision has been changed from OT II and OT III to Initial Operational Test and Evaluation (IOT&E).

Of equal significance is the elimination of the term OT I, which referred to operational testing conducted during the Demonstration and Validation Phase of development. It has been replaced by Early User Test and Experimentation (EUT&E) which includes one or many events depending on the program.

User involvement in tests

EUT&E events may include use of the Concept Evaluation Program (CEP), Innovative Testing (IT), a Force Development Test and Experiment (FDT&E), Operational Feasibility Test, or any other test providing for user involvement. Although the primary purpose of a specific EUT&E may be to support the force development process (as opposed to the materiel development process) it will provide data to assess a materiel or operational concept, support planning for training and logistics, identify interoperability problems and future testing requirements, and provide data to support an operational assessment for other than a full production decision.

Within the LHX Program the operational test community plans to make maximum use of EUT&E. The Advanced Rotorcraft Technology Integration (ARTI) Program which concluded this past year made extensive use of Army pilots from operational units to provide a user interface, while examining the technical feasibility of single pilot operations. These same individuals are currently working the Crew Station Research and Development Program (CSRDP) which will examine the differences between a one and a two seat cockpit, each incorporating LHX technology and automation. These individuals have been drawn from TRADOC and a wide variety of FORSCOM units.

MG James E. Drummond is Commanding General, U.S. Army Operational Test and Evaluation Agency at Falls Church, Virginia.

Fully equipped EOC unit

The Army is considering the establishment of an Early Operational Capability (EOC) unit containing not only operators, but also maintainers and support personnel who would be available to directly influence the equipment design, operability and employment. By maintaining their operational proficiency, their most significant contribution would be to provide a current user perspective during development with input available to the contractors, materiel and combat developers, and also the test community. There are numerous other opportunities for an EOC unit to influence the program. These include, but are not limited to training reviews, maintainability demonstrations and equipment mockup reviews.

Current plans include two additional major instances for using this unit. The first occurs during TECOM conducted Technical Testing (formerly known as Development Test-DT) of prototypes from the two contractor teams in the FY93 time-

(OTEA — Continued on Page 79)

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McDonnell Douglas + Bell = "SUPERTEAM"

by William R. McDonnell and Walter G. Sonneborn

THE LHX SUPERTEAM of McDonnell Douglas Helicopter Company (MDHC), Bell Helicopter Textron (Bell), and McDonnell Aircraft Company (MCAIR), is totally dedicated to providing the U. S. Army with a fully combat effective system with reduced pilot workload and increased survivability, supportability, and fightability.

To accomplish this task, a select team of highly experienced aerospace contractors has been formed. MDHC and Bell have, between the two companies, produced more than 90% of all Army helicopters and virtually all of the scout and attack helicopters. Now they will use this unparalleled experience in the design, development and production of the Army's LHX air vehicle system.

Jet fighter technology

Since no single-man, highly automated helicopter crew station has been produced, the SUPERTEAM turned to MCAIR's experience with single pilot crew stations for U.S. fighter aircraft. MCAIR has built three of the four U.S. single-pilot, high performance jet aircraft in existence today — the AV-8B, F-15 and F/A-18. Under MCAIR's leadership, Hughes Aircraft, Texas Instruments, Honeywell, Sperry, Eaton, and General Electric are providing their extensive experience in target acquisition, very high speed integrated circuits (VHSIC) processors, night vision pilotage sensors, communications/identification, flight controls/navigation, helmet mounted displays, controls and displays, and aircraft survivability equipment.

Management for the SUPERTEAM has been established in a Joint Program Office (JPO) located at Mesa, AZ. Ed Klein is the MCAIR program director responsible for the SUPERTEAM's LHX mission equipment development and integration **(Figure 1, next page).**

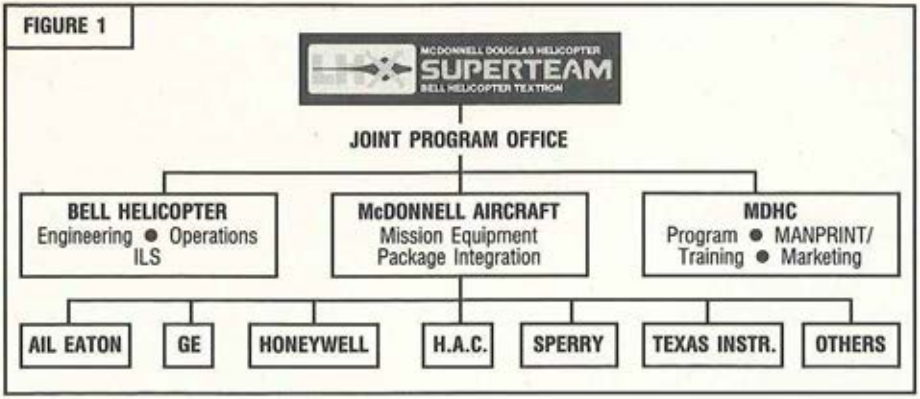
William R. (Randy) McDonnell is the LHX SUPERTEAM Program Director, while Walter G. (Walt) Sonneborn is the SUPERTEAM Deputy Program Manager.

The technical challenge facing the SUPERTEAM is to significantly reduce weight, with commensurate reductions to size and cost, through successful application of numerous technologies. To accomplish this reduction, a variety of technologies, most of which have been demonstrated in Army technology base programs (i.e. Aviation Composite Airframe Program (ACAP), Advanced Digital/Optical Flight Control System (ADOCS), Integrated Technology Rotor (ITR), Advanced Rotorcraft Technology Integration Program (ARTI) will be utilized. Offsetting these gains, however, are desired increases in operational capabilities such as improved survivability characteristics.

Choosing the right technology

The SUPERTEAM is fortunate since both Bell and MDHC have developed rotorcraft technologies that can be used for the LHX Program to meet this challenge. The initial task for the SUPERTEAM was to choose between these technologies, not to develop new ones. For example, such advanced systems as the MDHC No Tail Rotor (NOTAR) and Bell's Ring Fin anti-torque systems, the MDHC Helicopter Advanced Rotor Program (HARP) and Bell's 680 Rotor System, and advanced virbration elimination/control systems, to name a few, are viable candidates for LHX application.

Similarly, our avionics team members developed the LHX avionics system architecture and design based on current advanced technology and development efforts including Pave Pillar, ARTI, Integrated Communication Navigation Identification Avionics (ICNIA), Integrated New Elec-



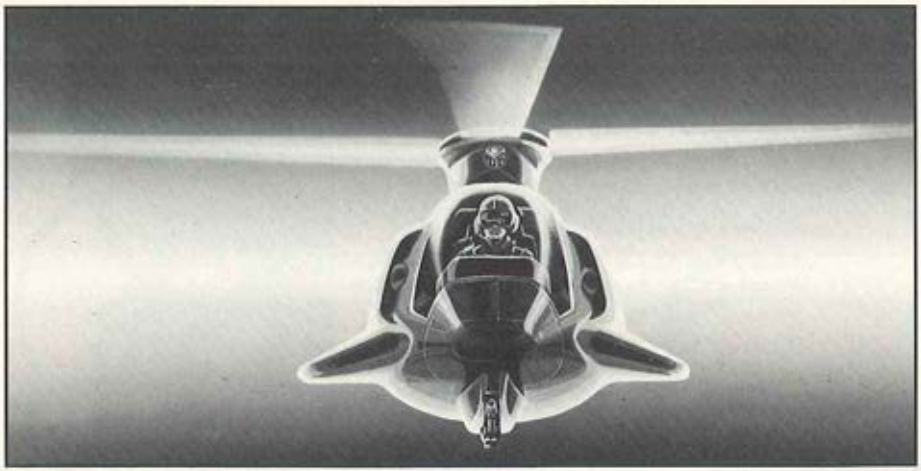
tronic Warfare System (INEWS), VHSIC Common Modules, Advanced Tactical Fighter (ATF) and MCAIR integration experience.

Our design not only meets the technical challenges, but offers increased lifecycle cost savings while providing built-in flexibility for future P^3I updates.

The SUPERTEAM is bringing this extensive experience, advanced technologies and resources to bear on the LHX program to ensure that the Army Aviation community receives an integrated aviation weapons system capable of meeting and defeating the threat of the 1990's and beyond in an air vehicle system that is supportable and affordable.

We are entering the hardware phase and are examining the development challenges that lie ahead. The schedule to first flight is crisp, as it should be, and will keep the engineering and manufacturing team motivated. Computer-aided design and manufacturing technologies have come to the forefront like never before. High quality composite material components will require a large number of integrated, high precision tools.

A fully integrated design process that implements Manpower and Personnel Integration (MANPRINT) considerations is in progress. In addition to the latest three-dimensional computer drafting technology, our full scale mockups will remain a principal design verification tool. This



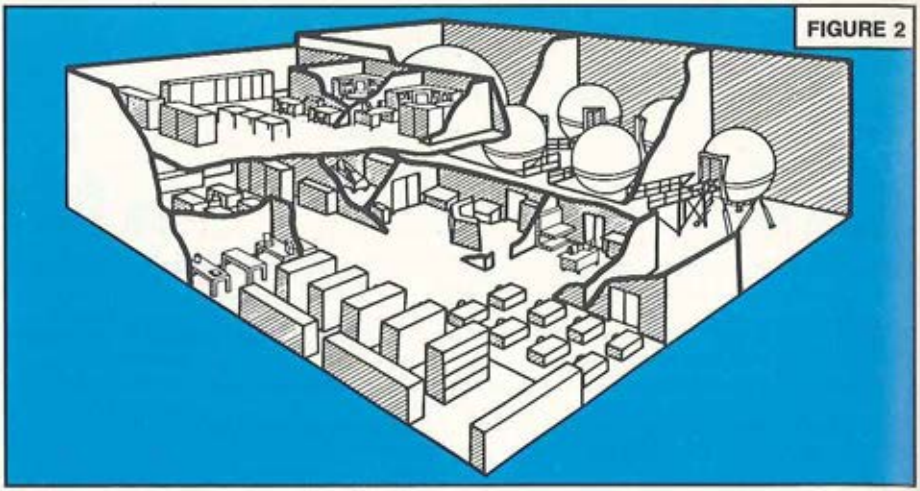


FIGURE 2

will be combined with a new level of simulation technology incorporating visual displays that are now fully capable of representing night, nap of the earth (NOE) engagements and air-to-air combat. The SUPERTEAM has invested heavily in the multidome simulation facility available for LHX **(Figure 2).**

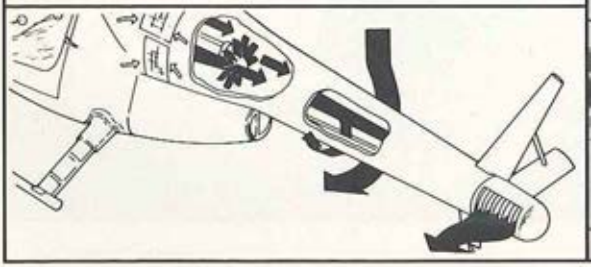
With this capability, the SUPERTEAM will effectively assist the Army in the evaluation of cost/benefit equations of the one versus two crew member question.

Early user aviator involvement in the engineering flight simulator has ensured that our design fits the man instead of the man being made to fit the design. Use of the flight simulator will allow an easy transition into production of the aviator flight trainers. Simulation, along with wind tunnel tests and flight demonstrations with surrogate and prototype aircraft, will provide early determination of performance. Supporting this process will be the parallel manufacturing and RAM/ILS activities.

The SUPERTEAM is dedicated to providing the Army with an advanced helicopter that can live with the Army in the field, defeat emerging threats, survive air-to-air encounters and conduct forward line of own troops (FLOT) operations, accomplish the mission, and provide the Army commander with increased available and effective combat power. IIIII

A tale of two tails

The McDonnell Douglas/Bell team has made no final decision on its choice of anti-torque systems, but viable candidates include: the MDHC No Tail Rotor NOTAR system (pictured below), and the Bell Ring-Fin system (right).



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

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

Advance Registrations may be submitted to the AAAA National Office at any time prior to **Monday, March 9, 1987,** together with full payment for the functions the individual wishes to attend. Advance Registrations received after **March 9** will be subject to a $10 late charge; none will be accepted after **Friday, March 20.** Full refunds of function fees will be made if notification is received at the AAAA National Office by phone or mail on or before **Friday, March 27.**

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

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

■■ HOUSING:
The AAAA National Office has reserved room blocks at five Fort Worth hotels and will handle all reservations for accommodations at **AAAA Convention Rates.**To reserve your hotel accommodations, complete and return the Advance Registration/Official Housing Form by **Monday, March 9.** Room requests received after **March 9** will be honored on a space-available basis only.

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

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

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

■■ AIR FARE SAVINGS:
American Airlines has been selected as the official carrier for the AAAA National Convention and will offer significantly reduced fares for travel to the convention. Certain restrictions apply. For reservations or more information, call the American Airlines Meeting Desk, **(800) 433-1790** TOLL FREE, 7 days a week from 7:00 a.m. to 12:00 midnight CST. Ask for **STAR FILE #S11817.** The savings apply to reservations for American Airlines flights between Saturday, April 4, and Monday, April 15.

■■ RENT-A-CAR SAVINGS:
Through the AAAA contract with Hertz — CPD-1D –83438, AAAA card-holding members attending the AAAA Convention may obtain the Hertz U.S. Government Discount on reservations made personally, or through travel agencies or corporate travel departments. The Hertz toll-free number is **(800) 654-3131.**

■■ BUS SHUTTLE:
Shuttle bus service will be provided between the Tarrant County Convention Center and the five Fort Worth hotels listed on the Official Housing Form. A complete Shuttle Bus Schedule will be provided approximately two weeks prior to the Convention.

■■ PROFESSIONAL SESSIONS:
The Professional Sessions taking place on Thursday, April 9, through Saturday, April 11, at the Tarrant County Convention Center, will be of special interest to all AAAA members, and are being arranged by **Major General Ellis D. Parker,** Commanding General of the U.S. Army Aviation Center and School, Ft. Rucker, Ala., who serves as 1987 Presentations Committee Co-Chairman. The Saturday Professional Sessions are being arranged by **Major General Richard E. Stephenson,** Co-Chairman and Commanding General, U.S. Army Aviation Systems Command, St. Louis, Mo. The Professional Sessions — all under the theme of **"The Aviation Team"** — will officially commence at 9:00 a.m. on **April 9,** with the Keynote Address scheduled for 9:15 a.m. Admission will be by Registration Badge.

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

■■ AAAA CHAPTER RECEPTIONS:
The Thursday, Friday, and Saturday evening AAAA Chapter Receptions are a MOST IMPORTANT AND UNIQUE PART of every AAAA National Convention. Six Chapters do their utmost nightly to top one another in providing their own brand of hospitality, entertainment, food, and beverages — for all AAAA Convention attendees. The 1987 Chapter Receptions will be held at the Hyatt Regency Fort Worth. Bus transportation will be provided from each of the "AAAA" hotels listed on the Housing Form.

■■ BELL HELICOPTER TOUR & HELICOPTER RIDES:
As a special feature of our first Fort Worth AAAA National Convention, the AAAA North Texas Chapter is sponsoring three two-hour tours of the Bell Helicopter Textron plant and helicopter rides on limited basis on **Wednesday, April 8.** Tours will be conducted at 11:00 a.m., 1:00 p.m., and 3:00 p.m. Bus transportation will depart from and return to the Tarrant County Convention Center. Admission to the bus will be by appropriate badge and ticket. Space is limited and will be available on a first-reserved, first-served basis.

ARMY AVIATION ASSOCIATION

1987 Official AAAA National Convention Housing Form

Please **print** or **type** all information. I understand that to receive a room at AAAA convention rates, I must register for the professional sessions or exhibits or attend at least one of the functions of the AAAA National Convention AND that this form must be received at the AAAA National Office by **Monday, March 9.** Room requests received after **March 9** will be honored on a space-available basis only. The hotels listed below will **not** accept direct reservations for rooms or suites at AAAA convention rates. All rates are subject to applicable local taxes. Cancellation or change of hotel reservations must be directed to AAAA by phone or mail through **Friday, March 27, 1987.** After **March 27,** contact your hotel directly. Failure to notify the hotel of a change in arrival may result in full cancellation.

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☐ Hyatt Regency Fort Worth
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Civilian Single or Double, $77

☐ Metro Center
Military Single, $35, Double, $45
Civilian Single, $38 Double, $48

☐ Park Central
Military Single, $35 Double, $43
Civilian Single or Double, $48

☐ The Worthington Hotel
Military Single or Double, $64
Civilian Single or Double, $77

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

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

1987 AAAA National Convention

Advance Registration Form—Official Housing Form

Tarrant County Convention Center, Ft. Worth, Texas — April 8-12, 1987

I plan to attend the 1987 AAAA NATIONAL CONVENTION. The Advance Registration Deadline is **MONDAY, MARCH 9, 1987.** Advance Registrations received after **MARCH 9** will be subject to a $10 late charge; none will be accepted after **FRIDAY, MARCH 20.** I understand that I may receive a full refund of my function fees by phone call made to the AAAA on or before **FRIDAY, MARCH 27, 1987,** or by written notification to AAAA that is received not later than **FRIDAY, MARCH 27.** Please **print** or **type** all information. **NOTE:** Military fees and room rates apply only to Active Army and DAC personnel and to those Reserve Component and retired AAAA members who are not in the current employ of defense contractors or suppliers on a full-time, part-time, or consulting basis. **Please make checks payable to AAAA.**

KEY: THIS BOX FOR OFFICE USE ONLY _____

FULL NAME INCLUDING RANK _____

MAILING ADDRESS _____

CITY _____ STATE _____ ZIP _____

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

UNIT/FIRM NAME FOR BADGE _____ OFFICE TEL ( ) _____

UNIT OR FIRM CITY AND STATE FOR BADGE _____

IS YOUR FIRM OR UNIT EXHIBITING? ☐ YES; ☐ NO FOR OFFICE USE ONLY

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

REGISTRATION FORM

SPECIFIC FUNCTION HELD AT THE 1987 NATIONAL	NOTE—Keynote Address and Prof'l Program begin at 9 a.m. April 9	MIL/DAC MEMB. OR	CIVILIAN MEMB. OR	ITEM LINE	OFFICE USE

CONVENTION OF AAAA	SPOUSE	SPOUSE	TOTAL	
❶ REGISTRATION FOR PROFESSIONAL SESSIONS & EXHIBITS	☐ $10	☐ $55	$_____	_____
❷ MEMBERSHIP FEE FOR NON-AAAA MEMBERS	☐ $15	☐ $15	$_____	_____
❸ BELL HELICOPTER TOUR & HELICOPTER RIDE, Wed., April 8	☐ # People	☐ # People	$ FREE	1
Check tour time preferred: ☐ 11 AM ☐ 1 PM ☐ 3 PM				
❹ EARLY BIRDS CASH-BAR RECEPTION AT BILLY BOB'S, Wed., April 8	☐ at $3 ea	☐ at $3 ea	$_____	2
SPOUSES TOUR & LUNCHEON—DALLAS NIEMAN-MARCUS, Thurs., April 9	☐ at $37 ea	☐ at $37 ea	$_____	3
AAAA MEMBERSHIP LUNCHEON, Thurs., April 9	☐ at $8 ea	☐ at $15 ea	$_____	4
SPOUSES BREAKFAST AT THE STOCKYARDS & SHOPPING, Fri., April 10	☐ at $12 ea	☐ at $12 ea	$_____	5
AAAA AWARDS LUNCHEON, Fri., April 10	☐ at $10 ea	☐ at $16 ea	$_____	6
PRESIDENT'S RECEPTION, Fri., April 10	☐ at $9 ea	☐ at $17 ea	$_____	7
SPOUSES TOUR & BARBECUE — RANCHLAND DUDE RANCH, Sat., April 11	☐ at $35 ea	☐ at $35 ea	$_____	9
TEXAS-STYLE BARBECUE BUFFET LUNCHEON, Sat., April 11	☐ at $7 ea	☐ at $14 ea	$_____	10
❺ AWARDS RECEPTION & BANQUET, Sat., April 11	☐ at $25 ea	☐ at $55 ea	$_____	11
AVIATION BRUNCH & CHAMPAGNE GET-AWAY, Sun., April 12	☐ at $8 ea	☐ at $13 ea	$_____	12
❻ CIRCLE METHOD OF PAYMENT: MasterCard VISA Personal Check Business Check		TOTAL	$_____	_____

CREDIT CARD NUMBER _____ EXPIRATION DATE _____

CARDHOLDER NAME AND SIGNATURE _____

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

This form, with the appropriate fees, must be completed and received by: AAAA, 1 Crestwood Road, Westport, CT 06880 — on or before MONDAY, MARCH 9, 1987. Phone: (203) 226-8184.

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

☐ MasterCard ☐ Visa ☐ American Express ☐ Other _____

Credit Card No. _____ Expiration Date _____

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

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

This form must be completed and received at AAAA, 1 Crestwood Road, Westport, CT 06880, with applicable fees, on or before Monday, March 9. For questions, call the AAAA National Office: (203) 226-8184.

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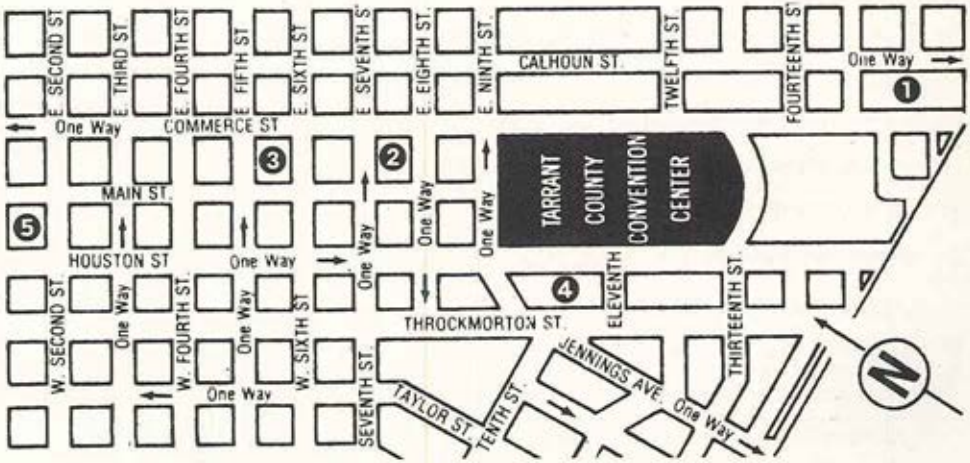
❶ — Fort Worth Hilton
❷ — Hyatt Regency
❸ — Metro Center
❹ — Park Central
❺ — Worthington Hotel



1987 AAAA National Convention
April 8-12, 1987 • Fort Worth, TX
General Information

■■ EARLY BIRDS RECEPTION AT BILLY BOB'S:

On Wednesday evening, **April 8**, the AAAA will sponsor an informal cash bar reception for "early arrivals" at **BILLY BOB'S TEXAS**, the world's largest honky-tonk. Bus transportation will depart from the Main Entrance of the Tarrant County Convention Center starting at 6:45 p.m. every 15-minutes until 8:45 p.m. Admission to the bus will be by ticket.

■■ SPOUSES PROGRAMS:

The AAAA invites spouses to participate in a program of planned activities from Thursday, April 9, through Saturday, April 11.

On **THURSDAY**, spouses are invited on a Dallas "Fashion City" Tour starting with a visit to the Dallas Market Center. Then, it's on to the famous Nieman-Marcus for a tour of the archives museum, a catered luncheon, and time for shopping and browsing. On the return to Ft. Worth, spouses will view the mansions of Turtle Creek and Highland Park. Bus transportation will depart from the Main Entrance of the Tarrant County Convention Center at 10:30 a.m. and return you to your hotel by 4:00 p.m.

On **FRIDAY**, the traditional AAAA Spouses Breakfast will be held at the Brown Derby in the famed Stockyards. Bus transportation will depart at 8:30 a.m. from the Main Entrance of the Tarrant County Convention Center. After breakfast, there will be time for "Western Shopping" before the buses return to the Tarrant County Convention Center in time for the Reception and 1987 Awards Luncheon.

Friday afternoon will be free for individual exploration - SUNDANCE SQUARE, located adjacent to the Worthington Hotel, offers a unique collection of shops, boutiques, restaurants, and galleries. Fort Worth also features the OMNI MUSEUM, the KIMBELL ART MUSEUM, the AMON CARTER MUSEUM OF WESTERN ART, the beautiful BOTANIC GARDENS, and the WATER GARDENS. Information on these points of interest and more will be available at the AAAA Registration Center.

Also on **Friday** afternoon, the AAAA Presentations Chairman will offer a special **FAMILY PROGRAM** at the Tarrant County Convention Center from 4:15 p.m. to 5:30 p.m.

On **SATURDAY**, the program is designed to highlight the flavor of the Old West with a trek out to a real "dude ranch". Wear your blue jeans, plaid shirt, boots (and bring a swimming suit) to be ready for horse riding, or a hay ride, volleyball, horseshoes, bingo, fishing, or just plain ol' relaxin'. Then, you'll enjoy a western barbecue with all of the fixins. Bus transportation will depart from the Main Entrance of the Tarrant County Convention Center at 10:00 a.m. and return you to your hotel by 4:30 p.m.

■■ AAAA MEMBERSHIP LUNCHEON:

The AAAA Membership Luncheon will be held on Thursday, **April 9**, at the Tarrant County Convention Center at which the AAAA will honor its "Outstanding Chapter Activities" and its top recruiters. This year's Luncheon will also feature a special ceremony honoring AAAA's 30-year members. All seats at this luncheon are unreserved.

■■ AAAA EXHIBITORS RECEPTION:

The 1987 Exhibit Hall Displays will officially open with a cash bar reception from 4:30 p.m. to 7:30 p.m. on Thursday, **April 9**. Admission will be by badge.

■■ AAAA AWARDS LUNCHEON:

The 1987 AAAA Awards Luncheon will be held at the Tarrant County Convention Center on Friday, **April 10**, and will be preceded by a reception. Senior Army representatives will present the AAAA's national individual awards. All seats at this luncheon are unreserved.

■■ THE PRESIDENT'S RECEPTION:

On Friday evening, **April 10**, the President's Reception will take place at the Hyatt Regency Fort Worth Hotel. Bus transportation will be provided from each of the "AAAA" hotels. The AAAA National President, **Major General George W. Putnam, Jr., Ret.**, and **Mrs. Putnam**; the AAAA Executive Vice President, **Arthur H. Kesten** and **Mrs. Kesten**; and the Commanding General of the USAAVNC, **Major General Ellis D. Parker** and **Mrs. Parker**, are expected to form the receiving line.

■■ TEXAS-STYLE BARBECUE LUNCHEON:

It's only fitting to feature an informal "Old West" Luncheon on the closing day of the Convention, Saturday, **April 11**. The luncheon will be held at the Tarrant County Convention Center. Seating at this luncheon is unreserved. Dessert will be served in the AAAA Exhibit Hall along with coffee, beer, and soft drinks. Music and Chapter Photos are planned later in the afternoon.

■■ AAAA AWARDS RECEPTION AND BANQUET:

The AAAA's premier event, the 1987 Awards Reception and Banquet will be held on Saturday, **April 11**, at the Tarrant County Convention Center. Senior Army representatives will present the AAAA's national unit awards.

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

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

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

Banquet guest acceptances must be received by Monday, **March 9**. If you are eligible to be a guest at the Banquet and have not received an invitation by February 1, please contact the AAAA National Office at (203) 226-8184.

■■ GET-AWAY CHAMPAGNE AND AVIATION BRUNCH:

On Sunday morning, **April 12**, the AAAA invites all Convention attendees to join the AAAA President in a champagne toast in the Presidential Suite at the Hyatt Regency Fort Worth Hotel. The Aviation Brunch, which is held simultaneously, offers AAAA convention attendees an opportunity to make their good-byes.

ARMY AVIATION ASSOCIATION

1987 AAAA National Convention
April 8-12, 1987 • Fort Worth, TX
Schedule of Events

Tuesday, 7 April 1987

1200-1700 Registration and Ticket Sales

Wednesday, 8 April 1987

0800-2100 Registration and Ticket Sales
1100-1300 Bell Helicopter Tour and Helicopter Rides
1215-1345 AAAA National Executive Board Luncheon
1300-1500 Bell Helicopter Tour and Helicopter Rides
1400-1730 AAAA National Executive Board Meeting
1500-1700 Bell Helicopter Tour and Helicopter Rides
1900-2100 Early Birds Reception at Billy Bob's Texas

Thursday, 9 April 1987

0700-1930 Registration and Ticket Sales
0730-0845 Chapter Presidents/Secretaries Breakfast
0745-0845 Speakers and Panelists Breakfast

Opening Professional Session

0900-0905 AAAA President's Welcome
0905-0915 Presentations Chairman's Welcome
0915-0945 Keynote Address
0945-1030 Aviation Branch Chief's Update
1030-1100 AAAA General Membership Meeting
1030-1600 Spouses Tour of Dallas/Nieman-Marcus

Morning Professional Session

1100-1130 Aviation Branch Update (NCO)
1100-1600 MILPERCEN Career Guidance
1130-1200 Membership Luncheon Reception
1200-1400 1987 AAAA Membership Luncheon

Afternoon Professional Session

1400-1430 Aviation Logistics Update
1430-1500 SEMA Training
1500-1520 Aviation and the Signal School
1520-1540 MEDEVAC
1540-1630 Panel Discussion - Q & A
1630-1930 1987 AAAA Exhibitors Reception
2100-0100 AAAA Chapter Receptions

Friday, 10 April 1987

0700-1730 Registration and Ticket Sales
0715-0815 Speakers and Panelists Breakfast

Morning Professional Session

0830-0850 National Guard Aviation
0850-0910 Aviation Force Structure 87
0910-0930 Training Developments
0930-0950 Force Developments
0950-1010 Aviation Safety
1010-1100 Panel Discussion
0830-1100 Stockyards Spouse Breakfast/Shopping
1100-1700 MILPERCEN Career Guidance
1100-1215 Awards Luncheon Reception
1215-1430 1987 AAAA Awards Luncheon
1430-1530 Exhibit Hall Social

Afternoon Professional Session

1530-1615 III Corps Commander's Presentation
1615-1730 Enlisted Program
1615-1730 Family Program
1615-1730 Warrant Officer Program
1615-1730 Chapter Presidents' Session
1900-2030 1987 AAAA President's Reception
2130-0100 AAAA Chapter Receptions

Saturday, 11 April 1987

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

Morning Professional Session

0830-0900 Industry Panel Discussion on Acquisition Contracting
0900-0930 Industry Panel Discussion on Product Support
0930-1000 Industry Panel Discussion on Contractor Logistics Support.
1000-1630 Ranchland Dude Ranch Spouses Tour
1000-1100 Exhibit Hall Social
1000-1630 MILPERCEN Career Guidance

Late Morning Professional Session

1100-1245 AVSCOM Readiness Posture and Initiatives — Utility, Cargo, Attack, Observation, Fixed-Wing, and Air-to-Air Developments.
1245-1300 Presentations Chairman's Closing Remarks
1300-1400 Texas-Style Barbecue Luncheon
1400-1630 Exhibit Hall Social/Chapter Photos
1830-1930 Awards Banquet Reception
1930-2200 1987 AAAA Awards Banquet
2200-0130 AAAA Chapter Receptions

Sunday, 12 April 1987

0830-0930 AAAA National Executive Board Meeting
0930-1030 Champagne Get-Away
0930-1200 The 1987 "Aviation Brunch"

★ ★ ★ ★ ★

*The specific functions, the speakers and the subjects of the presentations, and the dates and times of all presentations and social functions are subject to change.

ARMY AVIATION ASSOCIATION

Plan Ahead!

Win a round trip for two on American Airlines

American Airlines has been selected as the official carrier for the AAAA National Convention. In addition to offering significantly reduced fares to and from Ft. Worth, AAAA has announced a special give-a-way in coordination with the 1987 National Convention. A drawing will be held during the convention good for a round trip for two to anywhere in the United States, Hawaii or Caribbean that American flies.

To make your Convention reservations, call the American Airlines Meeting desk at **(800) 433-1790.** This TOLL FREE number is available to AAAA members seven days a week, from 7:00 a.m. to 12:00 midnight (CST). Ask for **STAR FILE #S11817.** The savings, which apply to reservations on American flights between Saturday, April 4 and Monday, April 15, include savings of a minimum of 35% off standard American fares.

ARMY AVIATION ASSOCIATION

Avco / Pratt & Whitney: Up-front planning

by Frederic D. Hyatt and David C. Hymer

IN 1941, **Field Marshall Herman Rommel,** "The Desert Fox", was quoted as saying in North Africa that ... "the Quartermaster will determine who wins the battle before it is fought". **Rommel** recognized that the best tactical plans, the finest soldiers, and the most brilliant commanders were crippled without the right tools, in the right quantities with which to fight. Similarly, **General Dwight Eisenhower** fully understood that without massive amounts of the right material, Operation Overlord, the invasion of Fortress Europe in 1944, would be impossible. Both commanders, although born, raised and trained in different countries and influenced by entirely different cultures, knew that success on the battlefield depends heavily on the quality of up-front planning and logistics preparation.

Planning for maintenance

Today, the Army's new acquisition strategy capitalizes on the battlefield commander's philosophy of up-front planning and preparation to achieve success. This refocusing of development efforts will allow the field commander of the future to depend far less on the "Quartermaster" to support his equipment. To implement this new strategy for the LHX, the Army challenged industry to coordinate its collective efforts in the development phase to achieve the right balance between technical superiority, logistical support, reliability, and producibility goals. The Army in concert with a congressional mandate for more affordable systems, also tasked industry to complete this development effort within projected defense resources. The Full Scale Development (FSD) program for the T800 engine which will power the LHX aircraft was one of the first programs to use the Army's new acquisition strategy.

To meet the new Army challenge, Avco Lycoming, a subsidiary of Textron, and Pratt & Whitney, a division of United Technologies, teamed and formed a joint venture to compete in the development of "The Power of LHX", the T800-APW-800 engine. That teaming arrangement brought together the management, technical and logistical expertise of two recognized leaders in aircraft engine design and manufacture.

Combined strength

Avco Lycoming has successfully produced and supported more aircraft engines for the Army than any other single manufacturer. Pratt & Whitney brings to the team design and materials technologies from the most advanced military and commercial aircraft engines in the free world. The combined strengths of the two companies formed into a cohesive and complimentary partnership for "best of both" in engine design.

The Avco/Pratt & Whitney (APW) Team was quick to recognize that the next generation of engines to power the Army Aviation's fleet must not only meet difficult technical goals but also unprecedented reliability and maintainability requirements within the Army's new MANPRINT framework. The engine contractor could no longer take the old attitude of ... "design it, build it and we'll figure how to support it afterwards."

The APW strategy to accomplish the Army's ambitious goals was to insure that the Reliability, Availability and Maintainability/Integrated Logistics Support (RAM/ILS) and MANPRINT requirements, cost and producibility were examined, analyzed and optimized at each step in the design process. From the onset, APW designed

Frederic D. Hyatt is Director of the Avco/Pratt & Whitney (APW) T800 Engine Program. David C. Hymer is the Deputy Director of the T800 Program.

an engine which would be totally responsive to the demands of the commander's combined arms team, with greatly reduced reliance upon the "Quartermaster". The new power plant design approach transcended developmental experience of the past which resulted in high operating and support costs.

Clearly, what was done "up front" in the design process would meet the goals of the Army's new strategy. With a successfully balanced design, the combat commander's ability and capability to perform his mission would be greatly improved by reducing combat service support personnel, repair parts and support equipment in the area where combat is the name of the game.

New design approach

APW recognized the DOD experience that 90% of air vehicle system life cycle costs are driven by decisions reached during Full Scale Development. Of that, 58% is Operating and Support (O&S) cost. A major shift in development philosophy was implemented and, as a result, a new design approach was born. To insure that the "Power of LHX" provides the reliability and maintainability, and ultimately field operational dependability, a totally new Interactive Logistics/Engineering Design Process was developed by APW. The process "invaded" typically parochial areas of interest and caused the myriad of developmental factors to be mutually understood to the point where system optimization was achieved without sacrificing the critical hardware specification and performance needs.

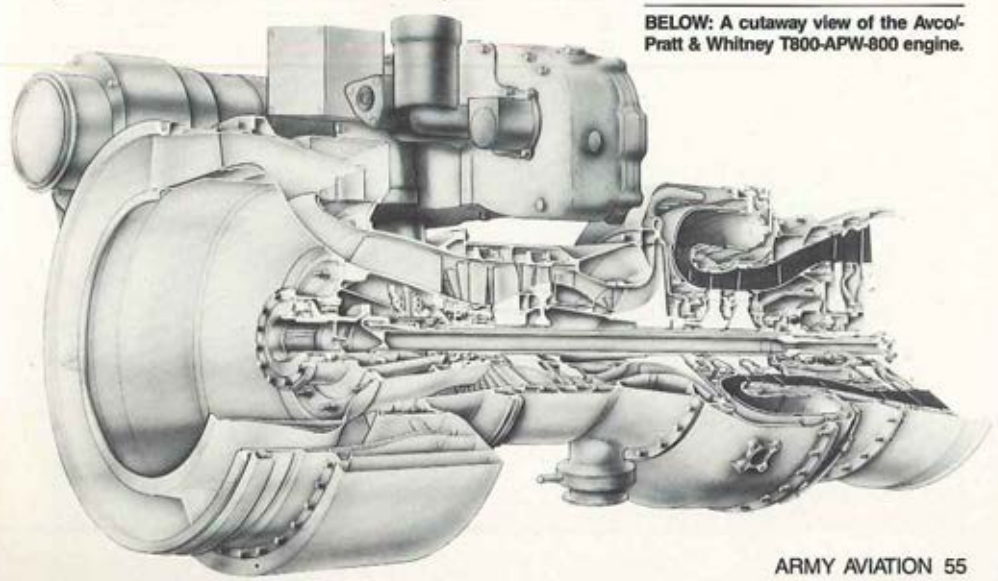
Using the Logistic Support Analysis (LSA) process as a tool to measure the engine design against requirements and constraints, the APW team has proven that the Army's new strategy can be achieved. Significant design influences have come from the RAM/ILS/MANPRINT, cost and producibility communities.

Disciplined documentation

The LSA process has played and continues to play a vital role in T800 engine design and provides clear and disciplined documentation to validate the design decision process. The interactive process also provides the program structure necessary to attain the new Army goals. This success occurred by providing equal authority for the APW engineering, logistics, cost, and producibility managers in the design decision process.

Simply stated, the new way of doing business utilizes an Interactive Logistics/Engineering Design Process to establish and maintain the balance between engine performance, RAM/ILS/-MANPRINT, producibility and life cycle costs considerations. By so doing, the critical "up-front" decisions are made which, in turn, pay off on the battlefield of tomorrow.

BELOW: A cutaway view of the Avco/-Pratt & Whitney T800-APW-800 engine.



The new design process does not operate in a vacuum. Early in the FSD program, APW designers were exposed to the rigors of typical field operating conditions so they could attain first hand knowledge of the real environment in which the engine will operate and be supported. This proved to be of immeasureable value in their approach to engine design.

Taking it on the road

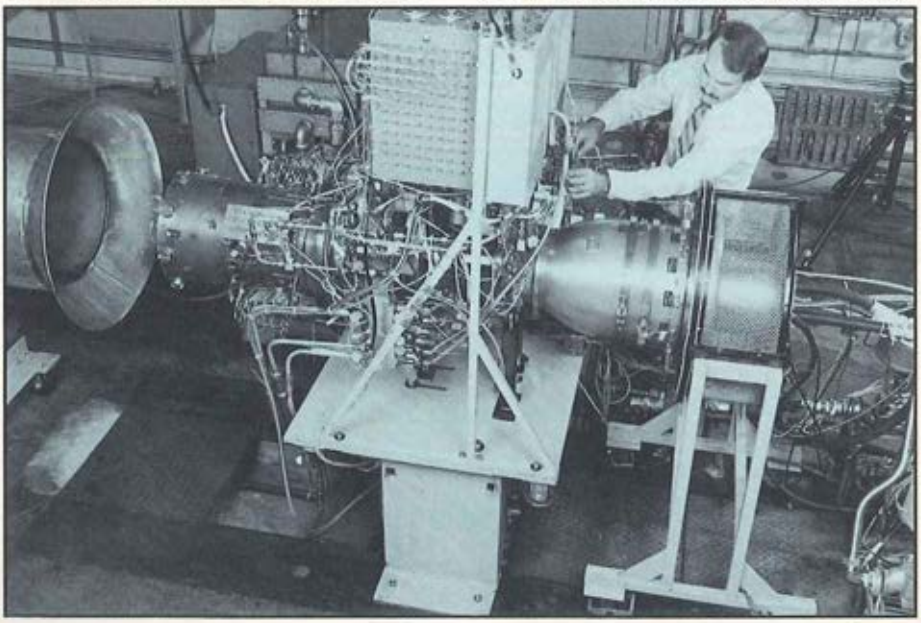
As the design moved closer to reality and the T800-APW-800 took form, shape and function, the APW Interactive Design Team took to the road with a maintainability review to visit Army field units, schools and depots. Early in the design process, a T800-APW-800 engine mockup was taken to the 101st Airborne Division (Air Assault), USATRADOC, USAALS, USAAVNC, DESCOM, and the Corpus Christi Army Depot. Visits to the 82nd Airborne Division, and the 1st Cavalry Division and 2nd Armored Division are planned for early 1987. The purpose of the visits were twofold: one, to provide a dialogue with Army Aviation personnel regarding the current design of the engine; and two, to solicit ideas for change to the existing design or contemplated improvements. The benefits of the Maintainability Review have far exceeded our most optimistic expectations. The Army spoke, and we listened.

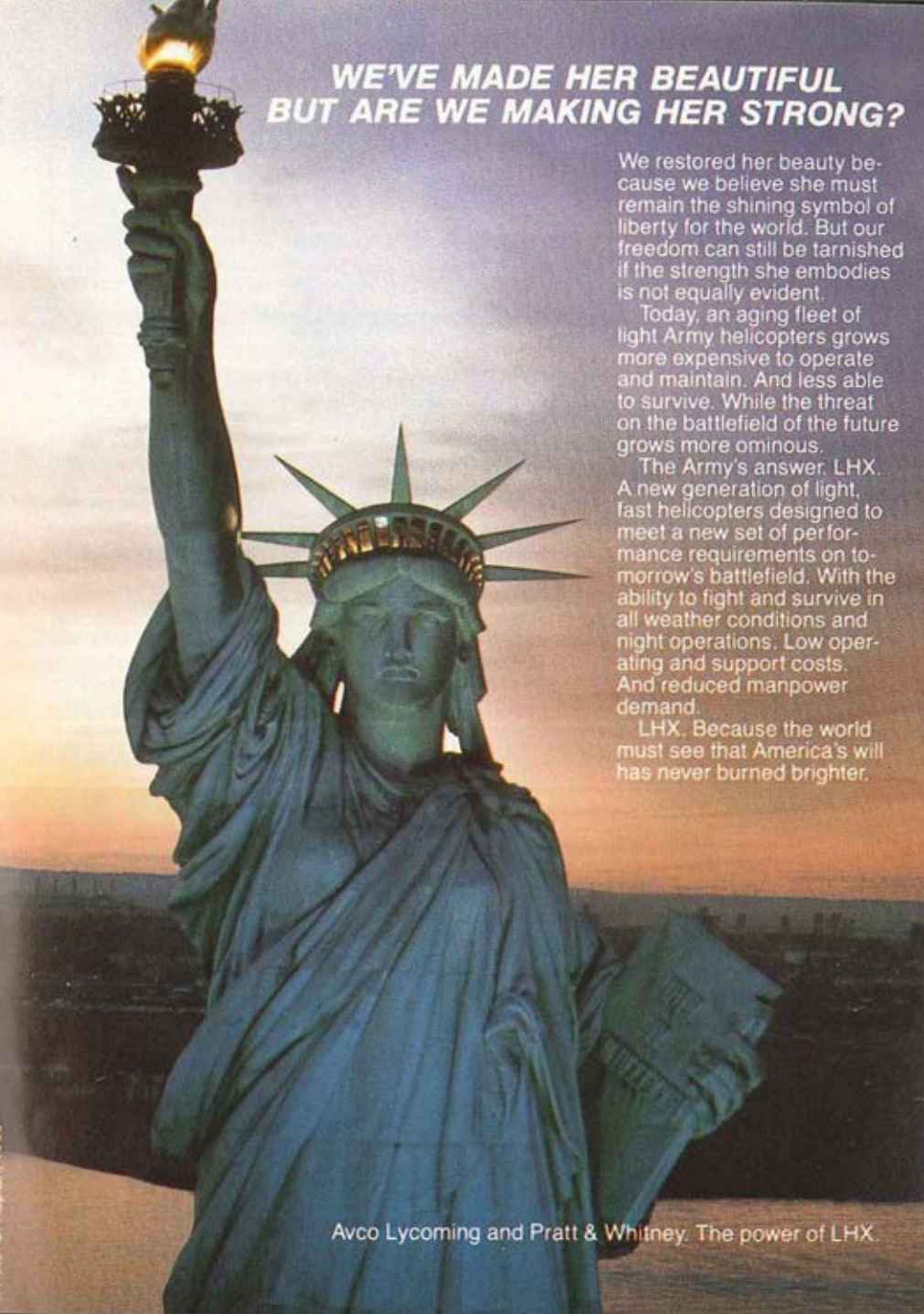
Planning for the battlefield

The Army's new acquisition strategy, and in particular the engine for the LHX, has refocused industry's vision and realigned industry's perspective to meet the demands of the battlefield. In the past, this often got obscured by the lure of new technology. Interestingly, it has done this during a time of unprecedented technological advances, the results of which will revolutionize the modern battlefield and enhance the Army's ability to perform its mission.

So, "It's What's Up Front That Counts" ... the APW team has and continues to meet the Army challenge to develop "The Power of LHX" based on designed-in RAM/ILS/MANPRINT, producibility, and affordability without compromising battle winning performance. The T800-APW-800 is one engine the "Quartermaster" won't have to worry about. IIIII

BELOW: A test engineer prepares an Avco/Pratt & Whitney T800-APW-800 full engine for tests at Pratt & Whitney's new small engine test facility in Florida.




WE'VE MADE HER BEAUTIFUL
BUT ARE WE MAKING HER STRONG?
We restored her beauty because we believe she must remain the shining symbol of liberty for the world. But our freedom can still be tarnished if the strength she embodies is not equally evident.
Today, an aging fleet of light Army helicopters grows more expensive to operate and maintain. And less able to survive. While the threat on the battlefield of the future grows more ominous.
The Army's answer. LHX. A new generation of light, fast helicopters designed to meet a new set of performance requirements on tomorrow's battlefield. With the ability to fight and survive in all weather conditions and night operations. Low operating and support costs. And reduced manpower demand.
LHX. Because the world must see that America's will has never burned brighter.
Avco Lycoming and Pratt & Whitney. The power of LHX.

LHTEC: Doing Business In a New Way

by Joseph A. Byrd and Paul J. Hurley

THE first step towards the fulfillment of the needs for the LHX — the procurement and acquisition initiatives incorporated in the Army's T800 engine program — have placed both government and industry participants on the vanguard of a new era in defense procurement.

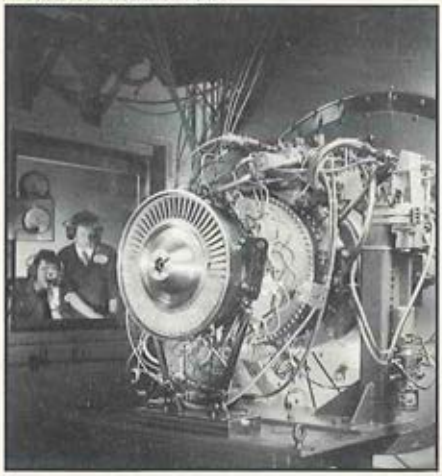
LHTEC, the Light Helicopter Turbine Engine Company, a joint venture partnership of the Allison Gas Turbine Division (General Motors) and the Garrett Turbine Engine Company (Allied Signal), formed solely for the T800 development, has embraced these initiatives fully. The Army LHTEC T800 program continues to lead the way in demonstrating that industry can successfully respond to the challenges of contractually binding RAM (reliability, availability, maintainability) guarantees with ceilings on acquisition, operation and support costs for the engine. The T800's contract features are unparalleled in the history of government procurement but ensures the Army an affordable, high performance powerplant for the new light helicopter fleet.

RAM/ILS/MANPRINT — From the T800's conceptual planning, RAM/ILS and MANPRINT features were to be intrinsic design objectives — not a design fallout. To ensure these objectives, LHTEC quantified and established specific design criteria for their designers and subsequently tracked and monitored progress during the engine design phase. To maximize effectiveness, LHTEC has kept the "man in the loop" for all design decisions, that is, the decisions were driven by the maintainer's needs, the actual soldier in the field who "turns the wrench." The design team was directed to accommodate the soldier and the anticipated conditions at the forward line of troops (FLOT) — hot or cold, wet or dry, friendly or hostile, protective gear or summer fatigues.

Designers and the RAM/ILS/MANPRINT engineering support groups were co-located and the side-by-side, day-by-day interface has ensured that the maintenance and support needs have been reflected in the end product. Further, engine designers were dispatched to actual Army AVUM organizations for reviews of current procedures and to hear critiques of design practices. These visits increased the designer's insight into the skill levels and personnel requirements available in today's fielded units and permitted incorporation of additional design features to satisfy MANPRINT objectives.

Joseph A. Byrd is the Allison/Garrett (LHTEC) T800 Program Manager. Paul J. Hurley is LHTEC Deputy Program Manager.

BELOW: LHTEC T800 engine testing was initiated six weeks ahead of schedule.



These early field visits and the designer/product support co-location results have been further augmented by the engine monitoring system (EMS). The EMS is designed to provide for automatic, highly accurate fault isolation to significantly reduce the time and maintenance skills required for trouble-shooting diagnostics.

The emphasis placed on these features has unquestionably resulted in favorable design influences. The T800 engine will require only a handful of small wrenches to rapidly remove and replace components and modules at unit level and, in contrast with earlier engines, will result in a significant reduction in depot support equipment. The engine can be supported by fewer maintainers requiring less specialized training thereby providing the Army with increased flexibility in manpower allocations.

Technical — A low risk approach to engine development has permitted LHTEC to accelerate its T800 engine test program. Prior to contract award, the partnership combined the design data available from the Army/Allison ATDE program and the Air Force/Garrett F109 program to create two T800 technology prototype engines. These early engines, aerodynamically and mechanically similar to the Preliminary Flight Rating (PFR) design, demonstrated performance in excess of the Army's RFP requirements and, with a pre-contract flight in a UH-1B, the suitability for helicopter application.

BELOW: LHTEC's T800 prototype engine demonstrates sand ingestion tolerance.

Concurrent with the detailed design data obtained from component development rigs to assess the performance and durability of the compressor, turbines, shafts, seals, etc., the prototype engines were providing additional design information to LHTEC's engineers. During 700 hours of testing, these engines have been used to evaluate the T800 for sand and ice ingestion tolerance, fuel delivery and ignition system performance, component vibratory strains and mainshaft bearing durability with interrupted oil flow. The initial PFR design release of the T800 benefitted from these early evaluations.

A complete T800 metric engine ran in August 1986, approximately six weeks ahead of schedule. Currently, engines are successfully undergoing test evaluations in both Phoenix (Garrett) and Indianapolis (Allison). The test program milestones are being met and the highly successful results to date are validating the LHTEC T800 design against the Army's requirements. Overall, the technical program area remains low risk after the first year of the contract. The incorporation into the engine design of only previously demonstrated technologies has served to reduce development risk while permitting engine testing to proceed on schedule.

Cost — A logical benefit from the early focus on RAM/ILS/MANPRINT features in the design process is an engine which provides a significant improvement in overall cost of ownership to the Army. LHTEC has expressed its confidence in satisfying all design commitments in the form of broad, far-reaching guarantees for the T800 engine. These guarantees are incorporated into contractually binding provisions in the current FSD contract and apply to production orders for the entire planned U.S. Army buy and the design life of the entire fleet of T800 engines. Not-to-Exceed (NTE) pricing for production engines and Operating and Support (O&S) costs are in place now, at the outset of FSD. Firm commitments extending so far into the future represent the most significant departure from the "old" way of doing business. Cost, in all of its many forms, has been established as an integral design parameter.

The LHTEC cost control approach has been divided into several major areas. Design-to-Cost, Procure-to-Cost, Manufacture-to-Cost, and Value

Engineering programs were constructed to encompass the overall cost philosophy of the partners. Design-to-Cost techniques were applied upfront in the design process and dictated component cost objectives consistent with the engine cost guarantee while Procure-to-Cost practices resulted in NTE goals to suppliers. Manufacture-to-Cost programs were aimed at assuring producibility of the design while both manufacturers were embarking on factory modernization programs. A traditional Value Engineering program was instituted for all high-cost parts or those components not meeting initial cost goals.

The objective was to realize cost reductions while maintaining contractual requirements for engine performance, weight, RAM/ILS and production competition. This focused, comprehensive approach to cost management will ensure that the contractual guarantees are satisfied.

Production Competition — The Army's acquisition initiatives for production competition on the T800 were very aggressive, but LHTEC has stepped up to the challenges. There were two major requirements: that an effective mechanism to prevent a divergent configuration during competitive production be developed and implemented; and, that the necessary preparation and planning be conducted to facilitate a smooth transition into rate production at both partners' facilities. The T800 engine will be a single design, qualified to the same U.S. Army specification, and produced in competition by Allison and Garrett.

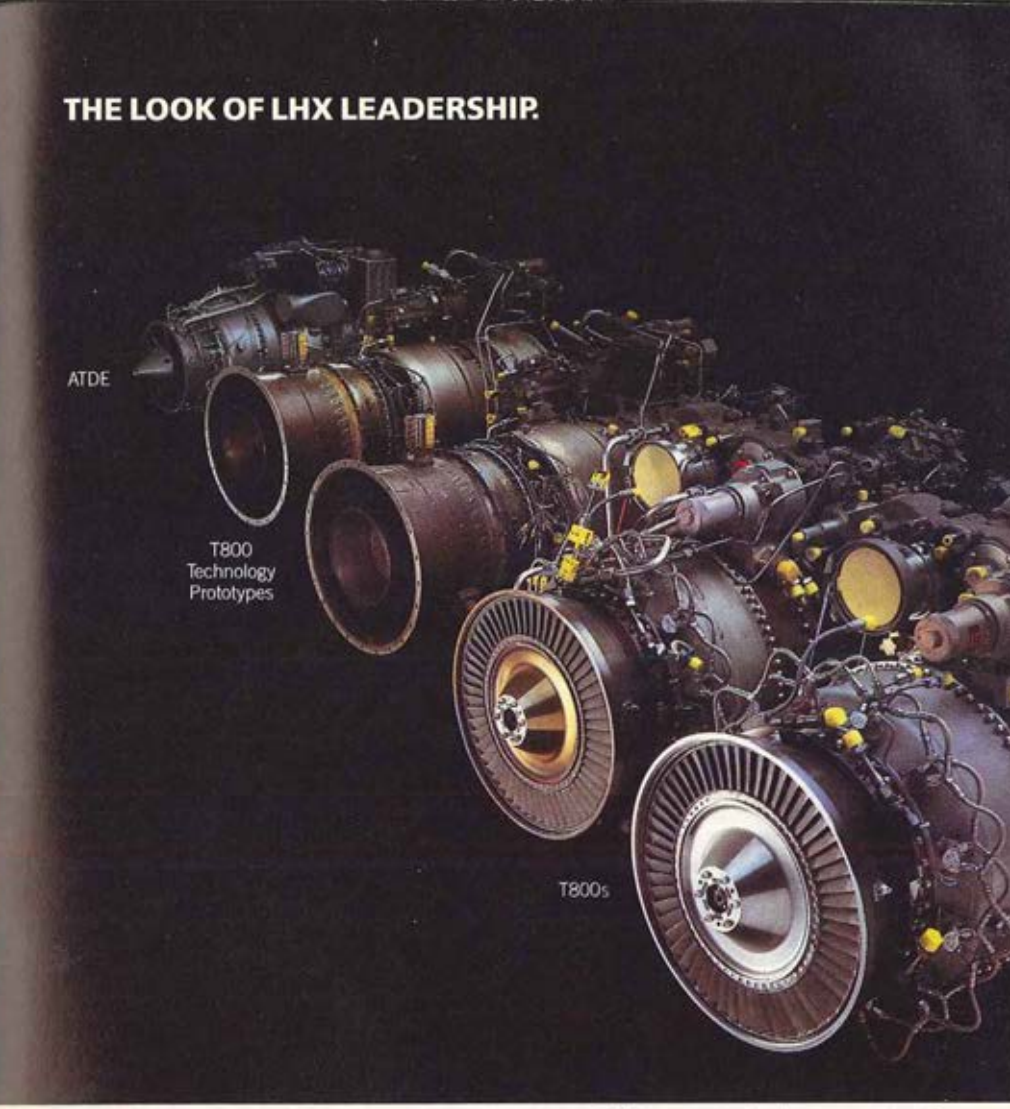
During the qualification phase of the program, each partner will produce entire engines in their own facility without relying on the other for furnishing any hardware, assembly, testing, or other services. LHTEC will remain as the configuration management control point for the life of the program to ensure the engine design remains identical for both producers and that the hardware remains completely interchangeable.

Further, every part in the T800 engine will have a minimum of two qualified sources in production. In the case of complex items requiring technology transfer, Allison and Garrett suppliers have entered leader/follower teaming, or licensing arrangements. The bold initiatives instituted by the Army for the T800 program have proven to be sound during the first year of the contract. The T800 design is superior to what it might have been with a more traditional approach. Technically, the engine has benefitted from the synergistic effects of two experienced small gas turbine engine contractors' engineering reviews and early technology transfer. The upfront emphasis on MANPRINT and ILS and the contractual guarantees on reliability, maintainability and cost have intensified and focused LHTEC's efforts to improve all aspects of the engine.

Fully developed, the Army's next generation of engines — the T800 — will represent a significant increase in helicopter powerplant performance and a quantum reduction in operating and support costs. IIIII

LHTEC T800 maintenance tasks being demonstrated in NBC protective gear.

THE LOOK OF LHX LEADERSHIP.



We have a history of being ahead.

We formed the first LHX team, combining experience from the U.S. Army's ATDE Program with the latest in F109 technology.

We ran and flew the first LHX demonstrator engine. Flew the first LHX candidate full-authority digital electronic control. Tested the first two T800 technology prototypes. Demonstrated oil-loss and sand ingestion capability. And now, we're the first to run the T800 at rated power. Ahead of schedule.

We're building upon an impressive base. 12,000 component/rig test hours and 8,000 hours of T800 power class testing since ATDE. Infusing new technology every step of the way.

LHTEC. Demonstrating a commitment that shows.

LHTEC

Allison & Garrett
America's LHX Propulsion Team.

LHX's "First Team": Boeing Sikorsky

by Louis S. Cotton and William W. Walls

MEETING the challenge of the battlefield of the future will require the LHX — an aircraft that will embody the most advanced and proven engineering, manufacturing and systems technologies. LHX represents not only one of the greatest technical challenges the rotorcraft industry has ever faced, but also one of the greatest systems management challenges.

Stepping out early

Recognizing the importance of the LHX to our nation's defense and to meet these challenges, Boeing Vertol and Sikorsky stepped out in front of the industry in early 1985 to form "The First Team". With the full commitment, involvement and combined resources of its parent corporations, the Boeing Company and United Technologies Corporation, the Boeing Sikorsky team established a joint program office in early 1986 staffed with Boeing and Sikorsky personnel and dedicated to managing the integrated Boeing Sikorsky efforts.

Providing the advanced technologies for LHX requires the integrated efforts of all team members. Our team has been in place and operating at full speed for more than a year. The time and effort has paid off creating a team organization that is dedicated to being totally responsive to the Army's needs.

The Army's needs include a balanced effort on airframe and avionics with the proper emphasis on technical performance, cost, Manpower Personnel Integration (MANPRINT), Reliability Availability and Maintainability (RAM), Integrated Logistics Support (ILS) and training.

Louis S. Cotton is the Boeing Sikorsky LHX Team Program Director. William W. Walls serves as the Deputy Program Director for the team.

Early teaming gave us a head start on the new supportability challenges that spring from the Army MANPRINT Program. The Boeing Sikorsky MANPRINT Program for LHX addresses the many aspects of the integration of man, machine, and environment. All MANPRINT, RAM, ILS and training disciplines have had substantial influence on our design activity throughout concept formulation. This early effort will assure that all supportability issues, particularly those involving integration of man and machine in the operating and maintenance environment, have impact at each design iteration. New support technologies including automated technical publications, integrated with expert diagnostic systems, are being developed in parallel with aircraft and avionics definition, design and development.

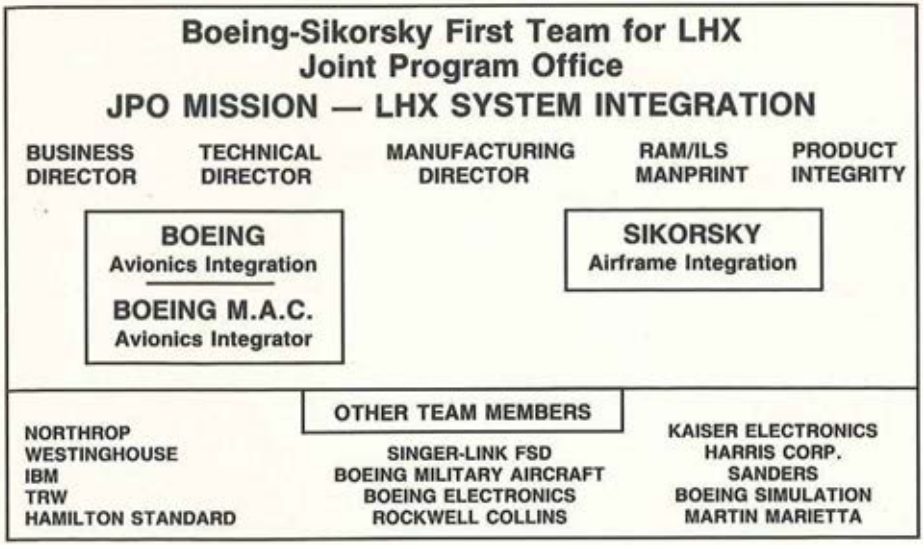
The training systems

The training system team of Boeing Vertol, Sikorsky, Singer-Link Simulation and Boeing Simulation are embarked on advanced training concepts integrated with the airframe and avionics concept definitions, design and development.

Computer Aided Logistics Support (CALS) will be an equal partner with CAD and CAM in the iterative design process that closely couples design, manufacturing and quality with after delivery product support.

Government and Boeing-Sikorsky investments in research and development have produced air vehicle and avionics technology that is far superior to that fielded today. Examples of R&D programs that have produced technology that is ready for development include:

Advanced Composite Airframe Program (ACAP) — a $30M Army Applied Technology Directorate (AATD) contract with Sikorsky that produced an all-composite fuselage for the Sikor-



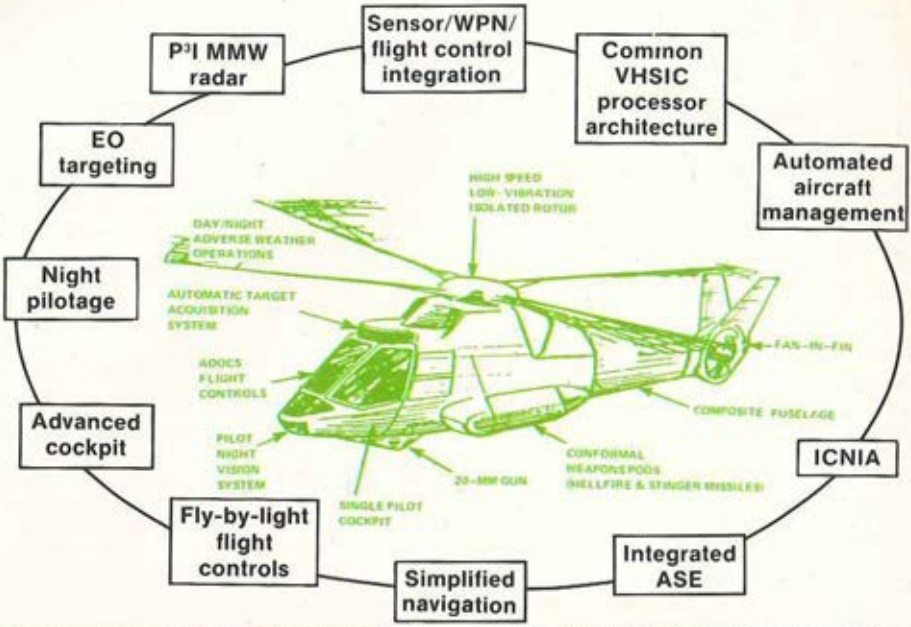
sky S-76 helicopter. The design and manufacture of the flight article demonstrated composite materials technology that is directly applicable to the LHX. The fuselage was designed to military standards and demonstrated weight savings that translate into smaller size and lower weight for the LHX. Cost savings were demonstrated that translate to lower acquisition and operations and support costs for the LHX. Independent research and development efforts such as Boeing's model 360 which will fly early in 1987, and other government programs such as the V-22 OSPREY program provide extensive composite materials technology for use by the Boeing Sikorsky team.

Advanced Digital Optical Control System (ADOCS) Program — a $25M AATD contract with Boeing Vertol that demonstrated a digital electronics flight control system that uses fiber optics to transmit the flight control commands to the rotor system actuators. The program developed flight control laws that substantially reduce pilot flight control workload when flying nap of the earth in a combat environment. Other benefits are reduced cost and weight, and greatly improved reliability and survivability.

Advanced Technology High Speed Rotor Development — with bearingless main rotors has had an intensive effort for more than eight years at Boeing and Sikorsky. Independent research and development and government contracted R&D have developed the technology to produce high speed composite rotor systems that will reduce the weight of the LHX and cost of ownership. This advanced technology rotor will provide the performance needed for the LHX to be effective against ground and air threats. Examples of avionics R&D programs that have produced technology that is ready for development by the Boeing Sikorsky team include:

Advance Rotorcraft Technology Integration (ARTI) — R&D contracts let to Boeing and Sikorsky by AATD total more than $30M. Under these contracts LHX single pilot requirements were developed, preliminary designs were evaluated and single pilot combat mission simulation and flight tests were performed. These AATD contracted efforts coupled with Boeing Sikorsky investments in piloted combat mission simulators and flight test vehicles have demonstrated single pilot design concepts that are ready for application in the LHX.

The ARTI program showed us that success of the single pilot LHX is dependent on low pilot workload to fly the aircraft and on automation of mission equipment to provide the quick response required to survive in combat. The ARTI program demonstrated that automation of navigation, communication, flight control, aircraft survivability-



equipment and weapons systems is ready for application now. The ARTI program also identified technologies that require additional development. That development will be completed in 1987.

These development programs authorized in the Army's FY87 ARTI budget include hardware system demonstrations of the following elements of the LHX avionics system:

- **Very High Speed Integrated Circuit (VHSIC)** chips for the LHX mission equipment central processor using ADA software language;
- **Electro-Optical Targeting and Acquisition System (EOTAS)** key elements; and
- **Night Vision Pilotage System (NVPS)** with a helmet mounted visor display.

The Boeing Sikorsky team is drawing on several related programs that have been funded by the Army, DOD or other services that contribute substantially to the development of critical elements of the LHX avionics systems. These include the DOD VHSIC Technology Development Program and Systems Programs such as SAIRS, ICNIA, INEWS, VHSIC 1750 Processor, Common Signal Processors, Digital Map, Color Displays, Pilot Visor Displays, Target Recognizer Algorithms and Sensor Fusion for targeting systems.

Resources are in place at Boeing and Sikorsky to develop the LHX. These include wind tunnels, avionics system integration laboratories, combat mission simulators, flight test vehicles and experimental flight test facilities that are essential for the development of the LHX weapon system. Our computer generated outside world imagery in our combat mission simulator shown below.

The combat mission simulator coupled with the SHADOW aircraft provide the tools we need to develop the requirements for the single pilot avionics system. Many of the workload reduction features of our single pilot cockpit design have already been demonstrated to Army Aviators in nap-of-the-Earth flight.

The Boeing-Sikorsky team has the technical and management team and the facilities in place to begin the LHX program now. We have had almost two years of working together to develop the organization and teamwork needed to make the LHX happen. We have the full support of the Boeing Company and the United Technologies Corporation. The Boeing Sikorsky team is ready for the LHX now. IIIII

Combat Developments:

Sustaining the aviation power: Using ACM/BDR

by Major Mark E. Warner

FT. EUSTIS, VA — Aviation, remaining on the leading edge of technology, is continuing to enhance the survivability of aircraft. Meanwhile, the battlefield anti-aircraft threat continues to become increasingly sophisticated. The result is a growing number of aircraft which will be able to land safely but which will require some type of repair before continuing the mission.

These crippled aircraft, combined with the workload of a wartime flying hour rate, will challenge the capability of maintenance units. Maintenance to current peace-time standards will rapidly overload maintenance units and deprive combat commanders of their aviation assets. The ability to rapidly return aircraft to a safe flyable status without lengthy repairs is essential, especially in the first few days of a conflict or during a surge in aviation operations.

The concept for the rapid repair of combat damage is the top priority of the Materiel Logistics Systems Division of the Directorate of Combat Developments at the U. S. Army Aviation Logistics School. The Aircraft Combat Maintenance/Battle Damage Repair (ACM/BDR) program will provide expeditious aircraft repair procedures and enhance the ability of maintainers to provide the maximum aircraft availability during intense combat operations.

The ACM/BDR program consists of rapid assessment and inspection techniques, deferability and serviceability criteria, quick fix repairs, and cannibalization procedures. This idea is nothing new. During combat, maintenance personnel quickly applied American ingenuity and developed numerous methods for sustaining the required readiness rate. Unfortunately, we have to relearn these techniques each time a conflict arises. The ACM/BDR program will provide a common methodology, tools, and repair kits. This program offers the tools to ensure standardization of procedures and provide a pre-conflict knowledge base.

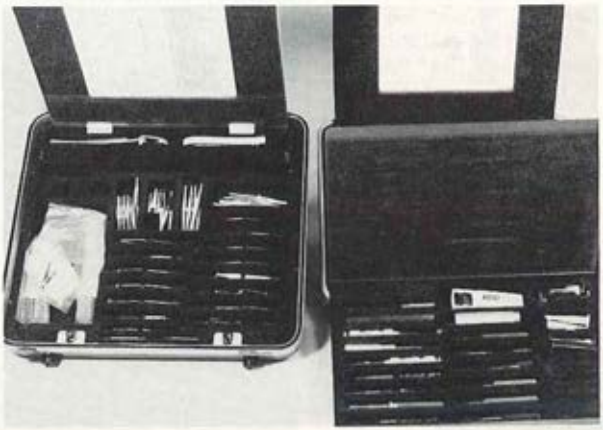
The ACM/BDR program consists of three phases: assessment, deferment, and repair. Assessment is the process of evaluating the damage sustained. It can be compared to the triage performed by the medical service personnel. A trained inspector will assess the damage with the aid of an aircraft specific manual. These manuals will contain assessment criteria with expedient repair techniques for a specific aircraft. Currently Sikorsky has completed the first draft manual for the UH-60A.

Deferment is simply putting off until time or the situation permits those things which are not absolutely necessary. As an example: a hydraulic servo has a leak rate which would be unacceptable during peacetime. This repair may be deferred during war. Scheduled maintenance, for the most part, would be deferred. Unscheduled maintenance may be deferred if safety of flight is not significantly degraded (repair of bullet holes in non-critical struc-

(ACM/BDR — Cont. on P. 80)

MAJ Warner is Chief, Materiel Logistics Systems Div. of the Directorate of Combat Developments at the USAALS.

BELOW: An example of various Aircraft Combat Maintenance/-Battle Damage Repair kits.



International:

The British Army Air Corps

by Major General David W. Goodman

MIDDLE WALLOP, UK — I welcome this opportunity to offer some thoughts for your consideration from a much smaller but equally dynamic air arm — the British Army Air Corps.

Almost uniquely, we in the Britsh Services have divided the ownership of battlefield helicopters since 1957 between the Army and the Royal Air Force. The Army flies all scout, command and anti-tank helicopters (mainly Gazelle and Lynx/TOW), while the RAF flies the support helicopters — Puma and Chinook.

The Army Air Corps rotary wing inventory is on the order of 325 helicopters, of five different types, manned by a little over 3,000 men, (this includes all operational, support, engineering, training, and staff Aviation posts). They are deployed in nine different countries from Brunei and Hong Kong, through Europe, to Belize and the Falkland Islands.

This lean man-to-machine ratio is achieved by putting basic flight training out to civil contract, by plugging into the RAF supply system and also into the Royal Navy repair system for deep servicing and major modifications — and by a lot of hard work!

Although we are deployed worldwide, the Central Region in Europe is, of course, our prime theatre of operations. It is here that the bulk of our anti-armour effort is concentrated.

Here, as elsewhere, it is the resources available which dictates our organizations, tactics, concepts, and future equipment plans. In many respects this differs quite sharply from American Army Aviation, simply because of the difference in scale.

For example, we regard the anti-tank helicopter as a division level weapon, fully integrated into the combined arms battle, rather than as a separate maneuver unit. It is normally fought in squadron (12 aircraft) or occasionally regimental (36 aircraft) strength, with an ability to deploy across divisional boundaries and be grouped for corps level operations — exactly as is artillery. RAF support helicopters are normally controlled at Corps level, being assigned for specific operations.

Our anti-armour tactics are based upon timely and accurate battle intelligence, rapid response from scattered hides, stealthy deployment to preplanned fire positions wherever possible and disciplined fire control to achieve the maximum shock and destruction at the critical moment.

A squadron ambush aims to take out a tank battalion. The tactic is designed to optimize (both in time and space) the helicopter's unique combination of exceptional mobility and concentrated fire power. The key to success is of course good C^3I.

For the future, we need to address two areas of growing importance: first the threat posed to our anti-armour and airmobile operations by enemy armed helicopters, and secondly our capability for operations at Army Group levels.

MG Goodman is the Director of the British Army Air Corps.

BELOW: An Aerospatiale GAZELLE of the British Army Air Corps.

The resources available will again determine how to cope with the armed helicopter. To have a dedicated type for the purpose is the ideal, but we may be forced to compromise in order not to degrade our prime capability — to destroy a massive armoured breakthrough.

So far as Army Group operations are concerned, we in the NATO Alliance need to work towards standardized procedures, in order to make effective cross-national corps boundary operations a reality. Only then will the helicopter achieve its potential.

As to future equipment, I believe that most of us in the Army Aviation business are striving to meet broadly similar goals. This has been very apparent to me in discussions over the last year or so with eight of my counterparts from Europe and North America. Again how we seek to achieve these goals is dictated by scale, and the concept of operations which flows from it.

For example, we in the Army Air Corps view the LHX program with envy — because of its scope, and great interest — because of the many new techniques it seeks to embody.

We are not, however, driven towards single pilot operation because our comparative smallness does not demand it. In fact, the opposite is the case. My personal opinion is that single pilot operation in the 24 hour battle, conducted nap-of-the-earth, in northern European weather conditions — at the intensity envisaged — could be an over-optimistic goal in human terms, as well as being technologically unaffordable for all but the United States. Time will tell, but I nevertheless greatly admire the determination to achieve such a capability, from which, whatever the outcome, there will undoubtedly be very significant technical spinoffs.

We in Britain are now formally linked with Italy, Spain and the Netherlands in a project to assess the ability of a much improved MkII version of the Agusta A129, armed with third generation anti-tank weapons and air defense weapons. This would meet our requirement for a replacement for Lynx/TOW in the late 1990s. This will be our equivalent of the LHX Scout/Attack (SCAT) aircraft.

The French and Germans have, for some years now, been seeking to define an agreed requirement in PAH2/HAC/HAP for the same roles. I do not believe that the final teaming will necessarily be as we see it today.

Most, if not all, of us in Europe will field collaborative aircraft in the next generation. Such collaboration should combine the best its participants can offer, promote interoperability and minimize unit costs. For this the collaborators must be prepared to compromise on their requirements, massage time frames and sacrifice a degree of independence. It is seldom an easy process, but the size of the European market by comparison with the U.S. demands it.

So we, like you, are living at an exciting stage of the helicopter's development. While the U.S. is pushing out the technological frontiers with LHX and conceptually with Air/Land 2000, we in Britain are now seriously addressing the question of ownership of battlefield helicopters. We do so for both economic as well as operational reasons.

For all of us, these are challenging times; times in which we should be stretching our intellects and our imaginations so as to make optimum use of this revolutionary fighting machine. But we must keep costs low and reliability and survivability high. The helicopter must prove itself to be a cost effective battle winner if it is to be given a chance to fulfill its promise.

I believe that this is our job in NATO's Army Aviation fraternity, no matter to which Army we belong. Affordability and lethality at the target are our twin aims in the British Army Air Corps. IIIII

A Westland LYNX firing a TOW missile.

Force Integration:

The FISO for AH-64: Planning the attack!

by Major (P) Gerald D. Saltness

WASHINGTON, D.C. — Two up — thirty-two to go! The second AH-64 battalion, 1-6 Cav, completed its 90 day intensive unit training in November 1986. I had the opportunity to observe a night mission being conducted by 1-6 Cav. The mission was to attack a corps deep target located approximately 120 kilometers from the unit's tactical assembly area. Conditions were overcast, light rain, and zero moon illumination (DARK!).

The unit's three attack troops flew different ingress/egress routes against the target that included several mock-ups of Soviet vehicles with heating devices covering the road wheels and engine areas. A tactical radar threat generator (TRTG) provided continuous scanning, looking for the inbound APACHEs. The entire unit attacked and destroyed the target exactly on schedule (could have set your watch by it). Given the same mission and conditions, there aren't many AH-1 units that could have come close to accomplishing this mission with the same results (except our old unit, right?).

LTC Barney Jenkinson's unit, 1-6 Cav, was most impressive and the training program being conducted by the 6 CBAC has truly set the standard for the remaining thirty-two battalions. The third 6 CBAC unit began training earlier this month.

The Army's senior leadership recently approved the deployment of 2-6 Cav to fill USAREUR's first AH-64 requirement in early 1988. The unit will participate in REFORGER 87, leave its equipment in Europe upon completion of the exercise, return to Ft. Hood and prepare for a unit move of soldiers and their families to Illesheim. Current plans are that only USAREUR's first unit will be filled by redesignating a FORSCOM unit. The remaining USAREUR units will form and train at Ft. Hood and immediately deploy to its assigned corps or division in Germany.

Are you due for a short tour? Want a home-based assignment at Ft. Campbell, KY? Interested in getting into the AH-64 program? If the answer to any of these questions is yes, you may be interested in being assigned to the 309th Attack Helicopter Battalion (AHB) currently forming at Ft. Campbell.

This unit, formerly C/229 AHB will deploy to the 17th Group, EUSA in late FY87. Young COBRA pilots could use this assignment to meet prerequisites for the AH-64 program upon return. MILPERCEN assignment officers are currently assigning personnel to the 309th with numerous follow-on assignments back to Ft. Campbell. AH-1 units at Campbell are scheduled to convert to AH-64s beginning in FY88. Contact CPT Carter or MAJ Barton (Commissioned), CW4 Henry (Warrant), or MSG Cole (Enlisted) for details.

Our office has received numerous phone calls asking if references to an AH-1F, AH-1E, or AH-1P aircraft have been printing errors or if there are new aircraft on the drawing boards. Wrong in either case! AVSCOM recently initiated an action to differentiate between the four variations of the AH-1S COBRA. The past inability to do so has resulted in the receipt and/or assignment of the wrong test and diagnostic equipment, insufficient funding to support force modernization, and miscommunication of aircraft distribution to the field.

The new COBRA aircraft designations are:

- **AH1S** — LIN # K29 694, NSN: 1520-00-504-9112 (Modified or oldest model)
- **AH-1P** — LIN # H297 62, NSN: 1520-01-168-4259 (Production model)
- **AH-1E** — LIN # H44712, NSN: 1520-01-192-2478 (Enhanced COBRA Armament System — ECAS)
- **AH-1F** — LIN # H44644, NSN: 1520-01-168-4260 (Fully Modernized or newest model)

The Aviation Division of ODCSOPS has had a large turnover of action officers over the past six months to include our chief. Some of the new faces in our office are: LTC Greg Clodfelter, CH-47; MAJ (P) Al Brocious, UH-60/UH-1; MAJ Ralph Hayles, OH-58/AHIP; Rod Rodriguez, ATC/Avionics; and COL Gene Grimsley, Chief, Aviation Division. LTC Kirk Curran is still working fixed wing along with MAJ (P) Henry Ruth, our LHX FISO. As always, our office welcomes any and all aviators, TDY or just passing through. Free coffee for attack guys! IIIII

MAJ (P) Saltness is the Force Integration Staff Officer (FISO) for Attack Helicopters at ODCSOPS, Aviation Division, HQDA.

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The Army's AH-64A Apache is everything an airmobile escort should be—and more. Fast. Aggressive. And armed with a payload of eight Hellfire missiles, 38 2.75-inch rockets and 1200 rounds of 30mm ammunition.

No other attack helicopter can carry as much firepower at a cruise air speed exceeding 150 knots for a range of 200 nautical miles and without auxiliary fuel tanks.

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MCDONNELL DOUGLAS

Operations:

Army Aviation in USAREUR: 1986-1992

by Colonel Richard M. Adams

APO NY — There have been many significant changes in Army Aviation in U.S. Army Europe (USAREUR) over the last year. To gain a perspective, USAREUR represents 1,200 Army aircraft, 2,200 aviators, 5,000 aviation related personnel, and 110 active U.S. Army Aviation facilities. That is approximately 25% of the Army's active Aviation force. By 1992 the number of aircraft will increase to over 1,400 along with attendant increases in personnel and facilities.

Foremost in our efforts to increase warfighting capability is force modernization and force structure initiatives. Aviation has played a significant role and will continue in the forefront in these two areas.

Major aircraft programs in USAREUR include the UH-60, the OH-58D in FAAD/artillery, the CH-47D modernization program, the RC-12 and, finally, the arrival of the AH-64 — the first total systems fielding effort. You are all familiar with these new systems but equally as important are the organizations into which they will be fielded.

The Army of Excellence is quickly becoming a reality in U.S. Army Europe. First, the aviation brigades are now on the ground with two having been activated in April of this year and the last of the divisional aviation brigades was activated in July.

COL Richard M. Adams is the Chief of the Aviation Division of U.S. Army Europe (USAREUR).

The next force structure activations will be the Corps Aviation Brigades and their three AH-64 battalions each. These organizations will complement the Regimental Combat Aviation Squadrons and the Aerial Exploration Battalions, which currely exist.

In addition to our modernization efforts, we have, on 15 October, taken the Air Traffic Control community under the aviation wing. The 59th ATC Battalion is now assigned to USAREUR with its 12 instrumented airfields and 31 other sites. With the ongoing modernization efforts and the units continuing integrations as full members of the combined arms teams, the issue of training becomes a major consideration in aviation operations. That training continues to improve as we begin to use the new publications coming out of TRADOC and the USAAVNC.

We have also completely revitalized our gunnery training efforts at Grafenwoehr Training area and can now truly say it is part of combined arms training and includes combined arms firing exercises. Combine all of this with the integration of MODE IV IFF initiatives, an ever increasing flying hour (225,000) operating tempo, training area restrictions, and noise abatement initiatives in USAREUR and you have the challenges of aviation in a forward deployed field Army.

As the AH-64 comes to our units in the field, we have begun to increase our night training capabilities. We are testing the limits of our night vision goggles capabilities to see just how much goggles flying we can do with just how much available light.

In addition, the challenge of maintaining our fleet with the security requirements due to anti-terrorism measures is a real world problem our commander lives with daily. How we can effectively increase our readiness posture continues to be an area of concern.

Total safety programs present us with challenges in our day to day flying as well as our unique winter weather that changes so quickly. We continue to strive for smarter training and our efforts in out-of-country training areas is an on-going program.

Another major effort is in the area of noise abatement where the aviator in the unit continues to be a constant source of help in new and innovative ways to reduce the noise molestation throughout the Federal Republic of Germany.

The aviation business in Europe is booming and we continue in the forefront as a member of NATO and the free world's most powerful deterrent force. IIIII

Fred B. Weller

Fred B. Weller, 64, of Ft. Worth, TX was killed on December 6, 1986 in an accident on his property. He retired from the Army in 1968 after serving for 28 years. His service included World War II as well as combat in Korea and Vietnam, primarily in Army Aviation.

At the time of his death, he was serving as a federal administrative attorney. Survivors include his wife Dorothy, and two sons, Michael and Peter.

Operations:

V Corps aviation: A vital force in Europe

by Major (P) Stephen R. Baribeau

APO NY — It has been over three years since our branch was officially organized and our progress toward full maneuver branch status has been remarkable. We have made great strides toward the development of dynamic combined arms warfighting doctrine, fielded evolutionary division and corps force structures, and replaced old aircraft with modern, more effective combat systems.

V Corps, as a forward deployed heavy corps, has played a key role in the growth of our branch. We have been instrumental in the development and institutionalization of new doctrine, organizations, and employment concepts.

In 1986, the Corps fielded its second and final combat aviation brigade, the Fourth Brigade, 3d Armored Division, commanded by Colonel Jerry Ginn. His brigade is structured much like the Fourth Brigade, 8th Infantry Division, which is commanded by Colonel James Hunt. The exception being that COL Ginn's cavalry squadron, the 3/12th, will not convert to 2x2 cavalry structure until FY 88. The 3/8th, 8ID converted to 2x2 structure on 16 November 1986.

V Corps Fourth Brigades have earned reputations as highly motivated, combat ready units capable of a full range of offensive, defensive, and special operations. They provide division commanders a flexible combat maneuver force which can be projected rapidly anywhere in a division sector.

The Fourth Squadron, 11th Armored Cavalry Regiment, is commanded by LTC Joseph Eszes. The unit, as a highly visible NATO unit, plays a key role in the deterrence of war in Europe. Its day-to-day mission is to gather intelligence on Warsaw Pact activities along the East-West German border and provide early warning to 11th ACR units and the V Corps commander should overt wartime actions be detected. Additionally, the Fourth Squadron is the 11th ACR commander's most mobile combat maneuver force and figures highly in all regimental defense and counterattack plans.

The 1st Military Intelligence Battalion (Aerial Exploitation) commanded by LTC George Spiczak is the Corps commander's primary tactical and operational intelligence gathering unit. In 1986, the 1st MI (AE) completed its conversion to AOE force structure. Electronic warfare and aerial surveillance companies use the latest in high-tech equipment. Utilizing Side Looking Airborne Radar (SLAR), Quicklook II, and Guardrail systems, the battalion — like the Fourth Squadron, 11th ACR — conducts daily missions along the East-West Interzonal German Border providing the V Corps commander with vital intelligence on Warsaw Pact activities.

The 205th Maintenance Battalion (AVIM), commanded by LTC Tom Johnson, provides backup AVUM and AVIM maintenance to Corps aviation units. The Battalion will begin conversion to AOE structure (L-TOE) in late 1987 forming HHC and two maintenance companies. The services of the 205th are critical to the long term success of divisional aviation maintenance companies and day-to-day maintenance operations of non-divisional aviation organizations. The 205th is the backbone of Corps aviation maintenance system, providing direction and support to all unit level AVUM and AVIM maintenance and aviation supply operations.

Last but not least, the 12th Combat Aviation Group (Corps) has had an exciting year. The Group, commanded by Colonel William Golding (who also serves as the V Corps Aviation Officer), remains the Corps commander's primary combat force for rear operations. The Group also provides critical combat support and combat service support for both division and non-divisional units.

In 1987 the Group will begin its important conversion to heavy corps AOE Combat Aviation Brigade structure. When completed, the new Brigade will be the Corps commanderr's most potent combat maneuver force, consisting of three to five AH-64A/AH-1 attack battalions and as many as two battalions of assault helicopters. The Corps Combat Aviation Brigade will provide the Corps commander a combat maneuver force with which he can directly influence the outcome of operational and tactical war plans.

Aviation today is a key combat force in V Corps. Aviation units **(V Corps — Cont. on Page 80)**

MAJ (P) Stephen Baribeau is the V Corps Deputy Aviation Officer.

Operations:

The Army's Only Airborne Aviation Brigade

by COL Harold E. Culley, Jr.

FT. BRAGG, NC — The 82nd Aviation Brigade, a major subordinate command within the 82d Airborne Division, was activated during ceremonies at the Main Post Parade Field, Ft. Bragg, NC, on 15 January 1987.

The tactical mission of this air maneuver brigade is to plan, coordinate, and execute combined arms operations designed to find, fix and destroy the enemy force. In addition to this mission, the 82d Aviation Brigade is prepared to deploy anywhere in the world on short or no-notice in support of the 82d Airborne Division's rapid deployment force mission. The AOE force structure requires the brigade to fight smarter and enables the brigade to move quicker and strike more decisively at the critical time and place to accomplish both the tactical and deployment mission.

Reorganized under the Army of Excellence concept, the Brigade is made up of assets from the 1-17th Cavalry Squadron, 82d Combat Aviation Battalion (CAB), and elements of the 313th Military Intelligence (MI) Battalion.

The Brigade now consists of the following units: HHC, 82d Aviation Brigade; 1-17th Air Recon Squadron; 20th Attack Helicopter Battalion (AHB); and the 135th and 183rd Assault Helicopter Companies (AHC).

The general concept of reorganization is as follows: Company C (General Support) of the 82d CAB will transfer (12) OH-58 aircraft and associated personnel to Headquarters and Headquarters Company (HHC), 82d Aviation Brigade. The headquarters company will also receive all fuel and ammunition handling personnel and equipment currently assigned to each aviation company. C Company of the 82d CAB will be inactivated when final equipment and personnel losses occur in April 1987.

The Brigade HHC commands, controls, and supervises all brigade operations to include the planning and Command and Control for helicopter resources augmented to the division from the XVIII Airborne Corps Aviation Brigade. In addition to traditional primary and special staff elements, the headquarters has (12) OH-58 aircraft for general support of the division.

HHC also provides all aviation fuel and ammunition handling assets for the entire brigade and has an airspace management element, a communications platoon, a medical section, and mess capabilities. The brigade commander and his staff function as a single point of contact for the division on all aviation-related matters.

Companies A and B, (Combat Support/UH-60) of the 82d CAB, will become the 135th (15 UH-60s) and the 183rd Assault (15 UH-60s) Helicopter Companies, respectively. The two Assault Helicopter Companies (AHC) (135th and 183rd), have a company headquarters, a flight operations platoon, a maintenance platoon, and three assault helicopter platoons consisting of five UH-60 helicopters each. The AHCs' mission is to rapidly move the combat troops and equipment throughout the battlefield.

Company D, 82d CAB will be redesignated as the 20th Attack Helicopter Battalion, and be issued (18) AH-64s APACHEs, (12) OH-58Cs, and (3) UH-60s. The 20th AHB is organized into a headquarters and service company and (3) attack companies. The maneuver assets of the 20th AHB is the division's greatest and most mobile source of combat power on the battlefield. The mission of this organization is to destroy the armor/mechanized and massed enemy forces with aerial firepower.

The fielding of the APACHE in the 20th AHB will provide a near all-weather aerial attack capability. The AH-64 will be equipped with HELLFIRE missiles, 30 MM chain guns, and 2.75 inch folding fin aerial rockets (FFAR). Its weapons systems, coupled with its night and all-weather capability gives the Division an attack profile never before available. The APACHE is especially suited for night operations due to its visionics and target acquisition designation systems.

Aviation Intermediate Maintenance support for the Brigade is provided by the 33rd Aircraft Maintenance Company (AMC), a subordinate element of the Division. This unit, made up of assets from Company F of the 82d CAB, is equipped with two UH-60s. The 33d AMC is the backbone of the brigade's maintenance and supply systems and boasts highly trained technicians who possess a wide

COL Culley is the Commander of the 82d Aviation Brigade at Ft. Bragg, NC.

range of skills.

The 1-17th Cavalry Squadron will become 1-17th Air Recon Squadron and will be configured with a headquarters and headquarters troop, (8) UH-60s, three air recon troops, (12) AH-1s, (18) OH-58Cs, and a ground reconnaissance troop (20 HMMWVS). The Special Equipment Mission Aircraft (SEMA) assigned to the 313th MI Battalion, (3) EH-60s, will be integrated into the 1-17th as part of the headquarters and headquarters troop.

The 1-17th Air Recon Squadron still remains the eyes and ears of the 82d Airborne Division. The Squadron provides: aerial/ground reconnaissance and surveillance; airborne communications, intercept, location, and jamming support for the division; and provides day and night combat operations during visual weather conditions and limited operations under instrument weather conditions.

The Brigade's greatest challenge under AOE is to accomplish day-to-day training mission requirements and respond to no-notice deployment contingencies with fewer aircraft and personnel. To meet this challenge, the Brigade must closely manage the assigned aircraft and be augmented by the Corps' soon to be activated XVIII Airborne Corps Aviation Brigade. The Corps Brigade will eventually have over 400 lift, attack and general support aviation aircraft.

The writing of Brigade SOP's, development of memoranda of understanding, and what on the surface seems a simple process of down sizing and evolving into an Aviation Brigade, has in reality become a major reorganization effort. It involves crossleveling of hundreds of lines of equipment and has resulted in the reassignment of several hundred airborne aviation personnel. As a point of information, all positions in the Aviation Brigade are coded parachutists.

The initial planning cell and the evolving Brigade staff are accomplishing all of these tasks professionally and expeditiously. The Division Staff and subordinate units of the Brigade have worked equally hard to ensure the 82d Aviation Brigade becomes a fully functioning member of the combined arms team.

Under Army of Excellence, the Brigade will provide the Division Commander with the capability to maneuver in the third dimension of the battlefield and to rapidly and violently destroy an enemy force. IIIII

Reserve Component:

Supporting One Army aviation training

by Lt. Colonel David H. Crawford

FORT RUCKER, AL — Army Aviation training is the business of the day, every day, around Ft. Rucker; and it is no less important in the Reserve Component Support arena.

The Directorate of Reserve Component Support (DRCS) at the U.S. Army Aviation Center and Ft. Rucker was reorganized in October 1985 in accordance with AR 5-3, Standard Installation Organization. Aligned under the installation's Garrison Commander, it is structured and manned to provide a single point of contact for administration and coordination of training and logistical support for U.S. Army Reserve, Army National Guard, and Reserve Officer Training Corps (ROTC) units.

To facilitate the support provided to the two Reserve Components concerned, each has an Active Guard/Reserve (AGR) officer attached to the installation and working within the DRCS. Serving as the coordinator for the U.S. Army Reserve (USAR) is LTC Geary W. Hancock, and MAJ (P) Charles E. Fern represents the interests of the Army National Guard (ARNG). Each plays a vital role in ensuring that all authorized support needs are met by the appropriate Active Component agencies.

The Reserve Component element of the Total Army is presently experiencing significant increases in personnel strength and equipment modernization. (Adequately equipped RC units have increased 15 percent in the last three years.)

This growth is typified by the states of North Carolina and South Carolina gaining APACHE Attack Helicopter Battalions in their National Guard structure next fiscal year. Another example is that under the near-term "USAR 2000 Plan," significant increases in BLACK HAWKs will be realized, coupled with the acquisition of COBRAs, both to be fielded within the structure of Aviation Group Headquarters and Combat Aviation Battalions.

In support of this growth and modernization, Ft. Rucker is doing its share. Numerous officers, warrant officers, and enlisted personnel from both the Army Reserve and the National Guard train at Ft. Rucker throughout the year in virtually all existing programs of instruction.

During FY 86, the ARNG ordered over 1,500 personnel representing numerous states and units to Ft. Rucker for aviation training. Of this total, more than 900 were officers and warrant officers sent to attend flight and nonflight courses. Those included the Warrant Officer Entry Course, Officer and Warrant Officer Aviator Qualification, Warrant Officer Senior and Advanced Courses, six aircraft qualification courses, ten instructor pilot qualification courses, and the Aviation Safety Officer Course.

Additionally, the first AH-64 pilots from the North Carolina National Guard graduated from the AH-64 Qualification Course.

In addition to these officers/warrant officers training at Ft. Rucker, over 550 National Guard enlisted personnel attended courses during the year in the Aeroscout Observer Course, the ATC Radar Controller Course, and the several helicopter repairman courses.

During FY 86, the U.S. Army Reserve student load at Ft. Rucker represented seven percent of the graduates in the officer and warrant officer courses, and six percent of the enlisted aviation course graduates. These students, like their ARNG classmates, trained in virtually all resident courses of instruction.

Members of the USAR also conducted training at the Aviation Center in such capacities as Individual Mobilization Augmentees (IMA), Special Active Duty for Training (SADT), and other Individual Ready Reserve (IRR) tours. A total of 152 USAR training tours were conducted at Ft. Rucker during the year, for a total of 4,138 man-days.

With the facilities at Ft. Rucker constantly used to near maximum capacity for student training purposes, aviation unit training on the installation by either Active or RC units is nearly nonexistent. However, during the past year Annual Training (AT) was conducted at Ft. Rucker by the 98th Divison (Training) Aviation Section (USAR), and by elements of both the 282d Aviation Company and the 376th Aircraft Maintenance Company (USAR). Additionally, the 282d and 376th conducted Inactive Duty Training (IDT) on Ft. Rucker throughout the year for more than 11,600 man-days.

(DRCS — Cont. on Page 80)

LTC Crawford is the Director of Reserve Component Support at the USAAVNC.

Test & Evaluation:

OTEA input to Army Aviation

by Lt. Colonel (P) Stuart W. Gerald

FALLS CHURCH, VA — The missions and functions of OTEA's Aviation Systems Evaluation Division were expanded during a recent reorganization. OTEA's Test Division was dissolved by assigning its test branches within the respective functional Evaluation Divisions. When the Aviation Test Branch joined our Division, our name was appropriately changed to "Aviation Division" to accurately reflect all aviation test and evaluation functions under one element.

The restructuring occurred simultaneously with my assignment as the Aviation Division Chief, the selection of Larry D. Leiby as Deputy/Technical Advisor, and Nancy Zittleman as the Chief of the Analysis Branch. We welcome LTC Kent Garry as the Chief of the Test Branch along with test officers LTC Charles (Chip) Adam and MAJ Warren Dudenbostel.

Our efforts to ensure that operational test requirements are incorporated into the LHX program are increasing because of recent changes in the acquisition strategy. We are currently developing the operational testing requirements to provide input for a Low Rate Initial Production (LRIP) decision in January 1993, and for an initial Operational Test & Evaluation (IOT&E-formerly OT II) prior to a full production decision in 1995. Near term involvement will be required in all efforts which continue to address the one versus two pilot issue for the LHX SCAT (Scout/Attack).

The recent completion of the AH-64A Attack Helicopter Battalion Training Validation (AHBTV) ushers in a new era for OTEA as we move to extend our C^2E efforts beyond fielding and Initial Operational Capability (IOC). LTC George Kitchens, recently assigned from OTEA's Counterair Division, is serving as our point-man on the DCSLOG's newly formed special Evaluation Working Group and will assist the ARSTAF's collective efforts in resolving remaining AH-64A issues.

With LTC Bill Wallace's departure, the V-22 evaluator baton was passed to MAJ Roger Rinehart. He will be assisted in the logistics area by LTC Kitchens. OTEA's near term effort will be to assist in the development of testable user issues and determining if these require Army unique testing.

The summer months were busy ones for the Army in regard to testing the Air-to-Air Stinger (ATAS) System. MAJ Rinehart, the OTEA Evaluator, observed the tests and wrote a Capstone Evaluation of the program. The system proved to have military utility and its effectiveness will be improved with the incorporation of missile upgrades. The integration of ATAS on utility and attack aircraft and the tactics involved in best utilizing this system are some of the issues remaining to be answered. The test results and how ATAS will be incorporated into Air-to-Air Combat tactics are items that will be heard more about in the near future.

The Army's recent decision on the future production of the OH-58D has caused plans for the OH-58D Follow-on Operational Test and Evaluation (FOT&E) to be revised. The revised test, the Army Aerial Scout Test, will be conducted in two phases beginning in March 87, to provide insight for the Army on how best to meet the aerial scout requirement. LTC Garry is designing the test and will serve as the OTEA Test Director. The Independent Evaluator is MAJ Pat Richardson. Analytical support will be provided by LTC Leo Seale. Allen Miller will be working the scout/attack mix study modeling effort.

Our single goal in this division is to assist the Army leadership in making the best informed decisions on acquiring aviation systems. The recent reorganization is oriented toward streamlining our portion of the acquisition process so that the Army can design, develop, test and field the very best aviation materiel as rapidly as possible. Early user involvement in the process is key and we are committed to make that happen. IIIII

LTC (P) Gerald is Chief, Aviation Div. of the Operational Test & Evaluation Agency.

Michael R. Cullen

Michael R. Cullen, a long-standing member of AAAA, passed away on November 9, 1986.

Retiring from the Army after over 20 years of service, he then worked as a Civil Servant in the Aviation Safety Office of the Army Test & Evaluation Command, at Aberdeen PG, Maryland, retiring in 1979. He is survived by his wife, Allie, and six sons.

Training:

Aviation Logistics Training at USAALS

by COL Dennis P. Vasey

FORT EUSTIS — The U.S. Army Aviation Logistics School (USAALS) is responsible to the Chief of Aviation Branch for aircraft maintenance and supply instruction which today consists largely of high technology task mastery.

With the advent of force modernization, advanced technology equipment has moved instruction away from the chalkboard and into technical manuals, limited hands-on application, and listening to a subject matter expert.

Today's technical gadgetry has complicated individual training beyond previous boundaries and is now a joint burden requiring coordination between individual training and collective unit training. In the classroom we now utilize interactive video disc devices and training simulators. Comprehensive battle damage has been added to realistic repair instruction.

Eventually, most field training exercises will be accomplished using embedded devices with decreasing reliance on aircraft. This results from our efforts to keep training technology abreast with aviation technology, while keeping the training resource bill at the lowest level.

Another evolution in training affects basic and advanced noncommissioned officer (NCO) technical training which will be revised to show NCO's how to design unit level maintenance and supply programs, plan and execute an aircraft repair, recovery, or supply program, and mentor subordinates.

Inherent to improved NCO education is the relationship between technical training and unit readiness. As we assess the technical needs of aviation units, it is essential that we translate those needs into training objectives that will produce maximum benefit to the success of AirLand Battle, consistent with AH-64, CH-47D, OH-58D, and UH-60A technology.

We are also moving to synchronize FM 1-500 with FM 100-5, and the revision will be available within the next year. Publication of this manual will provide the grist for maintenance and supply operations to keep pace with the operational tempo when securing the initiative and exploiting it vigorously to defeat the enemy.

We will prepare non-commissioned officers and aviation logistics course graduates to keep aviation maintenance units mobile while conducting scheduled/unscheduled aircraft maintenance and repair/evacuation operations. Once accomplished, we will have completed the link, and training will be consistent with doctrine.

Major changes in officer courses place more emphasis on technical qualification. While multiple choice and fill-in-the-blank tests will be used to a degree, the primary emphasis will be on thinking, not memorization. With an eye toward maneuver warfare — and a premise that fundamentals of tactics are neither definitions nor control measures nor formats — we are teaching our students how to maintain aircraft in an environment where threat, movement, and initiative are common considerations in maintenance programs.

Gone are the days of teaching formats which restrict thinking and create a mental box. Today, we teach students how to think creatively, to innovate, and to do the things that will most quickly produce long term readiness. Implementing the fundamentals — once the fundamentals are learned, that is, once the student has begun to think clearly about how to generate availability — is an important feature of training. But we intend for the fundamentals to be a spring board for new ideas and the ability to think and analyze while under pressure.

When we teach maintenance and supply in the old manner, that is, the procedure ahead of rational thinking, too often we produce structured mechanics who find it difficult to think without rules. What we want instead are soldiers.

We need your help in evaluating individual training and we want feedback on how to modify our programs to insure that the soldier skills meet the battle needs.

Please send a note or letter to my attention by writing to:

Assistant Commandant,
U.S. Army Aviation
Logistics School,
ATTN: ATSQ-TD,
Fort Eustis, VA
23604-5414

Support and Sustain! IIIII

COL Vasey is the Assistant Commandant at the U.S. Army Logistics School.

Training:

Maintenance Training Division of DOET

by SFC Dale D. Willis

FORT RUCKER, AL — Since its reorganization in October 1984, the Department of Enlisted Training (DOET) has been totally directed and operated by senior noncommissioned officers. The DOET staff is comprised of a deputy director and two division chiefs (sergeants major) with a master sergeant in the position of Operations Chief. These positions were formerly filled by lieutenant colonels and a major. The director's position — previously designated as an 06 position — is now filled by a command sergeant major.

The goal of the Maintenance Training Division (MTD) of DOET is to provide field commanders with qualified OH-58 and UH-1 aircraft mechanics who can perform both in a tactical as well as a garrison environment. MTD receives continuous feedback from field commanders to ensure the school is turning out quality mechanics. Currently, MTD is looking at the possibility of using computers in classroom training in an attempt to modernize the program. If the system proves practical, the course will be redesigned to allow for continued and expanded use of the computer system.

The course culminates in a three-day field training exercise (FTX) that reinforces all previous training of tasks performed within a garrison environment. During FTX, the student performs sling-load operations, mission-oriented protective posture (MOPP), and common soldier skills.

The Air Traffic Control Division has proponency for eight programs of instruction (POI). This division is responsible for the review and revision of sixty Army correspondence courses, 108 training extension courses (TEC) and FM 1-300, "Flight Operations and Airfield Management." The ATC Division is the proponent for the development and validation of the SQT tests for the 93H, 93J, 93P MOS and writing Standard Training Publications (STP) for the Soldier's Manual, Training Guide and Job Book.

In February 1982, the U.S. Army Communication Command (now U.S. Army Information Systems Command) submitted a proposal to consolidate the Air Traffic Control MOS 93H (ATC Tower Operator) and 93J (ATC Radar Controller) into a single MOS, 93C.

As a result of a survey in February 1983, the Army Audit Agency recommended a consolidation of the ATC MOS. TRADOC has approved the consolidation study plan proposed by the U.S. Army Aviation Center and we are now awaiting the final decision from the Deputy Chief of Staff for Personnel (DCSPER). Transitional packages designed for cross-training of personnel currently holding one of the two MOS are completed and are ready to come on line if the DCSPER concurs with the consolidation.

The consolidation of the 93H and 93J MOS will also affect the Advanced Non-commissioned Officer Course taught at Ft. Rucker. Our department is now developing the MOS specific portion of the ANCOC course which will be submitted to TRADOC in April 1987. The course length will be approximately eight weeks.

A Basic NCO Course for CMF 93 is on the way. The course is being aligned in the same format as combat support and will contain a leadership development core and a MOS-specific track. The Basic and Primary Technical courses for CMF 93 were deleted per TRADOC guidance. We will submit the course to TRADOC in April; pending its approval, the first class will begin in October 1987.

Training for one of the newest MOS, Aeroscout Observer (93B), is now being conducted by our department. This course is designed to train enlisted personnel to perform aeroscout observer duties in the OH-58A/C. Future enlisted aeroscout observers will be proficient in the OH-58C aircraft systems, emergency aircraft handling, mission planning, artillery adjustment, navigation, and many other tasks. The 93B Aeroscout Observer Course is 14 weeks, three days in length.

In October 1989, DOET will become proponent for another new MOS, ATC System/Subsystem Repairman (93D).

The Department of Enlisted Training has high expectations for the future, as we have many new and innovative ideas on the horizon. We solicit your ideas and suggestions, please write to: Director, Dept. of Enlisted Training, U.S. Army Aviation Center, Ft. Rucker, AL 36362-5255, or call AUTOVON 558-4824. IIIII

SFC Willis is with the Operations Branch of DOET at the USAAVNC.

Training:

The Aviation Training Brigade

by Colonel Haspard R. Murphy

FORT RUCKER, AL — Rising like a Phoenix from what had been the Department of Flight Training, the Aviation Training Brigade, Ft. Rucker, AL, has grown in size, scope and mission.

As the first born child of the newly-organized Aviation Branch, the Aviation Training Brigade was activated on 3 October 1984, and immediately offered aviation branch officers increased opportunities for command.

For the old hands that have not been back to Fort Rucker for awhile, the new organization was born of the old. The old Hanchey Division is now the 7th Aviation Training Battalion. Cairns Division is now the 8th Aviation Training Battalion and what was Lowe Division is now the 9th Aviation Training Battalion. In addition, the new organization contains Shell Field as a separate detachment command subordinate to the Brigade.

The Brigade is organized with a standard headquarters primary staff, and has special staff positions which support our unique training mission. Since its activation, the Aviation Training Brigade has grown in complexity and mission. On 2 October 1985, Charlie Company, 7th Aviation Training Battalion was activated with a unique and challenging mission. The only unit of its kind in the Army, "C" Company is tasked to train instructor pilots, aviators, and aerial observers in the OH-58D (AHIP) in all modes of flight to include contact, terrain flight, NOE, and NVG flight. The FY87 TDA will see "C" Company expanding to four commissioned officers and 37 warrant officers, and they will receive a fleet of 14 OH-58D aircraft to support this critical mission training.

Another addition to the Brigade is Task Force 1-112. The Task Force was activated on 17 April 1986. During the Army Systems Acquisition Review Council (ASARC) III in July 1985, the Vice Chief of Staff of the Army directed the Aviation Center to form a test unit at Ft. Rucker to:

- "scrub" the organization and operational concepts for the AH-64 and OH-58D equipped units,
- validate the OH-58D training program prior to the first fielding, and
- validate the selection, training, and operational effectiveness of the enlisted aerial observer (EAO 93B).

This test unit was designated Task Force 1-112. The Task Force is a provisional unit that is being filled with top quality, experienced officers and enlisted personnel as a matter of directed military over strength. The TF consists of a battalion headquarters section, three modified Army of Excellence (AOE) attack helicopter companies, and a modified AVUM company. The three ATKHCs consist of:

- a OH-58D/AH-64 company,
- a OH-58C/AH-64 company,
- and one pure AH-64 company.

The Task Force is currently at 100% commissioned officer, 100% warrant officer, and 70% enlisted personnel strength. Task Force 1-112 will participate in Phase I of the AHIP Follow-on Test and Evaluation (FOT&E) during the period 1 March 1987 through 13 May 1987 at Ft. Hunter-Liggett, CA.

This phase of the FOT&E will encompass issues dealing with air cavalry operations. Phase II of the FOT&E will also occur at Ft. Hunter-Liggett during September-October 1987 time frame. Phase II will address the attack helicopter issues of the FOT&E.

As can be seen, Task Force 1-112 has a challenging mission in support of Army Aviation, and the product of its labor will impact well into the next decade.

The last addition to the Aviation Training Brigade, the 10th Air Traffic Control (ATC) Battalion (SPT), was activated on 13 June 1986. Previously the USAISC Signal Battalion, the redesignation as the 10th Battalion more accurately reflects the support role it provides to the Aviation Training Brigade..

Operating 27 Air Traffic Control facilities and 100 NAVAIDS, the 10th Battalion provides 24 hour per day, all-weather ATC service in support of this organization's critical training mission.

The Aviation Training Brigade is composed of nearly 1,700 military and civilian personnel working in support of the USAAVNC mission. It is through the herculean efforts of these outstanding men and women that Army aviation remains "An Extra Dimension of Excellence." IIIII

COL Murphy is the Commander of the Aviation Training Brigade at the U.S. Army Aviation Center at Ft. Rucker, AL.

Ambrose (Continued from Page 2)

I continue to view this program as a model from which the Army and DOD can derive important changes in the conduct of other major programs. There is a good story to be told — a story of closely scrutinized requirements, in-depth analysis, clean-sheet-of-paper consideration of operational doctrine, improved acquisition methods, more productive interaction with industry, and so on.

The coming year should see the completion of the initial ARTI phase, submission of the COEA and certification documents to the Congress, and approval of the FSED phase. That means 1987 will be an even bigger milestone in this most important Army project.

But this is no time to relax. The intensive past effort has to continue. There are many approval and performance hurdles still ahead of us. IIIII

LHX Support (Continued From Page 30)

and supplement the LHX diagnostic/prognostic systems with those judgmental things only a skilled crew chief can provide. The Technical Inspector must be trained as a dedicated TI, not just an Additional Skill Identifier (ASI) in addition to other duties. In our 18-month evaluation of CMF 67 we clearly established the absolute need for a TI career field. I can foresee an even greater need for qualified TI in the future than we now have; a need that has been long recognized but not always met.

The bottom line

Bottom line to the entire two-level maintenance concept is the fact that we must be looking now at how this can be done — doable and affordable — maximizing operational readiness while keeping support resources in men, money, and materiel within affordable bounds. I can not foresee us arriving at two-level maintenance with the LHX as if we were to pull up a shade. In Vietnam through necessity we implemented a two-level maintenance concept for aircraft engines and it worked.

We need to look critically at those aircraft systems that will lend themselves in part to a two-level maintenance concept within the current state-of-the-art. There are challenges that need to be addressed now for the major components of maintenance, supply, and people. Phase II of the USAALS study will be doing this. There is a payoff here. We need to find it. IIIII

OTEA (Continued from Page 39)

contractors have complied with contract specifications, but also some insight into how well they have succeeded in achieving the optimum man-machine interface. The other obvious benefit is input into the operational effectiveness and suitability assessment of the prototypes, prior to the selection of one contractor team for continued LHX development.

The second event includes a series of TRADOC conducted field experiments to assist in the development and then to improve the maturity and quality of LHX doctrine, tactics and organization. If properly executed, we can insure participation in IOT&E by a well trained EOC unit, using the most effective employment techniques. This will contribute to the conduct on an operational test and evaluation, using a representative operational unit containing an appropriate mix of experienced and new personnel, which can demonstrate the true capabilities of the LHX under operational conditions.

The materiel development process is designed to develop modern equipment to meet the combat needs of the soldier. With efficient use of an EOC unit and EUT&E, we have an opportunity to improve the outcome through direct user involvement. As with everything else in the LHX program, the operational test and evaluation effort is anything but business as usual. We are actively involved in transforming the concept of Continuous Comprehensive Evaluation (C^2E) into reality through the use of EUT&E. It is our intent to support the LHX program as a role model for future programs. IIIII

DCD – Cont. from Page 65

tures would be deferred).

The ACM/BDR repair is intended to restore sufficient serviceability to the damaged system to allow the aircraft to continue flying operation missions. These repairs will be accomplished using a series of stand-alone, lightweight repair kits. These kits will contain all the tools, adhesives, bench stock, and expendables necessary to accomplish the repairs for which the kits are designed. As these rapid repair techniques are being developed, they are evaluated by AVSCOM engineers for inclusion in daily maintenance procedures. Numerous repair methods have been adopted for daily use on the flight line.

The USAALS, in conjunction with the Aviation Applied Technology Directorate, has developed the first in a series of ACM/BDR repair kits. The electrical repair kit, which contains all the materiel necessary to repair approximately 90% of the wires and connectors currently in use or proposed for use in the aircraft fleet, is scheduled to be fielded in September, 1987.

The hydraulic repair kit, structures kit, and the fuel cell repair kit are in various stages of development. The initial operational capability for the ACM/BDR program is September, 1990. In the development and fielding of the ACM/BDR program, USAALS will provide aviation maintainers the capability to sustain the required level of aviation combat power. IIIII

V Corps – Cont. from P. 71

are flexible and highly maneuverable members of the combined arms team. They provide another means with which the commander can decisively influence battles and campaigns.

V Corps aviation will become even more formidable in 1987 and years to come. Future corps aviation units will be better equipped and organized for improved effectiveness on the AirLand Battlefield. Improved helicopters, visionics, and aircraft survivability devices will improve aviation unit ability to survive enemy fires. Improved force structure, new weapon systems, long range communication equipment, and evolving combined arms employment doctrine will keep Corps aviation units on the leading edge of change.

We will continue to improve the commander's ability to quickly gain a relative combat advantage over the enemy anywhere on the battlefield. Aviation units will decisively influence Corps and NATO defensive warfighting plans and continue to be a key player in the growth of Army Aviation Branch. IIIII

TOXIC TESTING — An AH-64A APACHE from the Aviation Development Test Activity undergoes the tests at Dugway Proving Ground, Utah to determine possible degradation of the helicopter operations in a toxic environment.

DRCS – Cont. from Page 74

Nonaviation RC units find Ft. Rucker a highly desirable training location, and numerous such units use it for AT and IDT. For the last 12 months these citizen soldiers conducted more than 61,000 man-days of such training on the installation. Plans for RC unit training at Ft. Rucker for FY 87 show a significant increase in AT man-days.

Aviation trainers, like their other combat arms counterparts, fully recognize the indispensability of the Reserve Component forces. Ft. Rucker's mission of training aviation personnel for the Total Army force is not taken lightly in the Directorate of Reserve Component Support. We do not look for ways to circumvent support of the Army Reserve and National Guard, we look for ways to improve it. IIIII

BRIEFINGS

Collins Govt. Avionics Corp. announced that its Navstar Global Positioning System (GPS) has exceeded military-specified position accuracies during more than 6,300 hours of field testing. The GPS will provide U.S. armed forces with precise position in three dimensions to within 16 meters. The tests were conducted with Army vehicles, including the UH-60 helicopter, using a variety of operating environments. The environments included: nap-of-the-earth, operation under dense foliage and during electronic jamming conditions.

ABOVE: CASA Aircraft's CN-235 twin turboprop has received FAA certification. The fixed wing troop transport can hold up to 48 soldiers.

Ohio State University will host the Fourth International Symposium on Aviation Psychology on April 26-30, 1987 in Columbus, OH. The objective is to improve aviation safety by focusing on pilot factors which account for 80-85% of all aviation accidents. For further information, please contact: Dr. Jensen at (614) 422-1116.

ITT Corp. announced it has consolidated its U.S. Defense and Government services units under the newly formed **ITT Defense Technology Corp.**, headquartered in Washington, D.C.

COBRO Corp. has been awarded a major RAM/LOG data system contract by the U.S. Army Aviation Systems Command in St. Louis, MO. It requires the collection of operational, maintenance, and supply data used in the assessment of RAM/LOG, complementing the work COBRO is doing at the USAAVNDTA at Ft. Rucker, AL.

McDonnell Douglas Helicopter Co. (MDHC) and the U.S. Army have reached agreement on contracts totalling $1.6 billion for AH-64A APACHE helicopter production and support covering FY86 and 87, with an option for FY 88 procurement. Two milestones were recorded when **MDHC** delivered its 184th APACHE to the Army, and the APACHE fleet surpassed 30,000 flight hours. McDonnell Douglas deliveries in 1986 totalled 117 APACHE aircraft.

ABOVE: The Project Manager for Smoke/Obscurants at Aberdeen Proving Ground, Maryland has announced the theme of the 11th annual S/O symposium is, "Smoke: A Combat Multiplier". It will be held April 21-23, 1987 at Kossiakoff Conference and Education Center, Johns Hopkins University For further information, contact: Walter G. Klimek, AMCPM-SMKT, APG, MD 21005. (301) 278-5411.

A joint venture between **Texas Instruments** and **Hughes Aircraft Co.** has been awarded a $4.5 million contract to perform a multi-sensor fusion program documenting fused sensor data concerning the target acquisition process. The two companies are allied with the **McDonnell Douglas-Bell "SUPERTEAM"** for LHX.

HAI has announced the 1st annual EMS Safety Seminar, "EMS — A Team Approach". Chaired by Dr. Frank Austin, Federal Air Surgeon (FAA), the seminar will include participants from the FAA, ASHBEAMS, ALEA and NFNA. It will be held February 25, 1987 at Loew's Anatole Hotel in Dallas, TX. For further information, contact: HAI at (703) 683-4646.

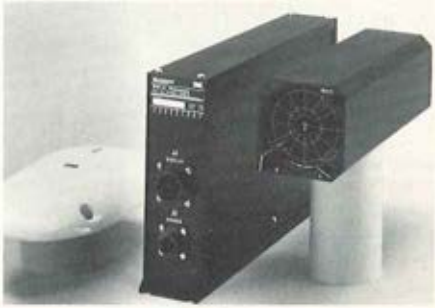
BRIEFINGS

GRAY

DANIELL

United Technologies Corp. has announced the retirement of Harry J. Gray as chairman of the Board of Directors effective December 31, 1986. Gray will be succeeded by Robert F. Daniell, **UTC's** current President and CEO.

AEL Industries announced that it has been awarded a $2 million contract to produce 44 receiver/ transmitters for the AN/VPS-2 Radar System. The contract was awarded by the U.S. Army's Armament Munitions and Chemical Command (AMCCOM) in Rock Island, IL.



ABOVE: 3M Stormscope weather mapping systems have been approved under the new Technical Standard Order (TSO C110) recently established by the FAA. The announcement comes after five years of flight and ground based research and study by the FAA, RTCA, NASA, the Dept. of Defense and others. Data displayed by the Stormscope Systems provides thunderstorm detection to a range of 220 nautical miles.

Awards and Honors

AAAA CHAPTER "OUTSTANDING AVIATION SOLDIERS OF THE MONTH"

HANAU — SP4 Armando Meza, 58th AMC
NURNBERG — SP4 David Gilmore, 2d CAS
TAUNUS — SGT David V. Shepard, 11th Avn Bn

U.S. ARMY AVIATION CENTER GRADUATIONS

December 11, 1986

Guest Speaker: BG Samuel G. Cockerham (Ret.)

Officer Rotary Wing Aviator Class 86-22
2LT Kevin M. Cieply, Distinguished Graudate
2LT Ludwig J. Schumacher; 2LT Michael S. Dwyer; 2LT Richard E. Duplechin - Honor Graduates

Warrant Officer RW Aviator Class 86-21:
WO Clark D. Mallder, Distinguished Graduate
WO Robert D. Witzler; CW2 Daniel R. Jollotta; WO Donald R. Scholl; WO Robert L. Poynter - Honor Graduates.

December 17, 1986

Guest Speaker: COL Albert E. Hervey, Jr.

Warrant Officer Senior Course Class 87-1:
CW3 Allan E. Rickard, Distinguished Graduate
CW3 Garry L. Smith; CW3 Robert L. Schaller; CW3 Gary W. Lindroth - Honor Graduates.

AVIATION COMMAND CHANGES

The following are Aviation Officer Assignment changes as per MILPERCEN, and aare subject to change:

COL Raymond G. Boland — currently Commander, Aviation Brigade 3d ID. To become FORSCOM Aviation Officer, Ft. McPherson, GA. Effective date of change: April 7, 1987.

LTC (P) Clinton B. Boyd — currently FORSOM Aviation Officer. To become Commander, Aviation Training Brigade, Ft. Rucker, AL. Effective date of change: April 15, 1987.

Brig. Generals

MOORE, Walter B.
ADCS, 3d ID, (Mech)
APO NY 09031

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OSTERMEIER, William F.
5257 Signal Hill Drive
Burke, VA 22015
STONE, Gordon L.
NSA Box 490
FPO New York 09521

Lt. Colonels

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CARPENTER, John D.
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DALE, Ronald
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125 Plough
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Planning to move soon? **Please notify us early! – Page 63**

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Home stretch!

With just 15 days left in the Jan 15, 1986-Jan 15, ***Chapter Membership Enrollment Competition,*** the standings among the 54-odd AAAA Chapters stood as follows. Rank is based on ***net membership gain.***

Master Chapters
(225 or more members)
(1-$400) (2-$300) (3-$200)

Rank		Net Gain
1	Monmouth	+63
2	Morning Calm	+55
3	Wash, D.C.	+47
4	S. California	+31
5	Thunderhorse	+27
6	Colonial Virginia	+20
7	Connecticut	+4
8	Delaware Valley	+3

Senior Chapters
(112-224 members)
(1-$300) (2-$200) (3-$100)

Rank		Net Gain
1	Hanau Chapter	+103
2	Taunus Chapter	+63
3	Stuttgart	+44
4	Link Memorial	+42
5	Greater Atlanta	+27
6	Mt. Rainier	+22
7	Wings of Marne	+9
8	Suncoast Chapter	+8

AAAA Chapters
(25-111 members)
(1-$200) (2-$100) (3-$50)

Rank		Net Gain
1	Lone Star	+83
2	Arizona Chapter	+63
3	Leavenworth	+29
4	Mainz Chapter	+26
5	N. Lights	+21
6	Tenn. Valley	+19
7	Cedar Rapids	+18
7	Pikes Peak	+18

AAAA Overview

■■ Nat'l Board approves 13 budget items

Following a report by a four-member *Ad Hoc Fiscal Committee,* the AAAA Nat'l Board approved the following items against the CY87 budget:

(1) Retained in the **Operating Fund** to meet November 86-April 87 operating costs.....$35,000.

(2) Addition to the **Emergency Fund**.....$7,500

(3) Initial deposit in a three-year, three-deposit **"Hall of Fame Escrow Account"**.....$5,800

(4) Allocation to provide **"Branch Insignia"** to newly-branched officers at USAAVNC.....$700

(5) Underwriting of three **Individual Member Enrollment Awards** at $650 per Awardee for the *Top Recruiter of (1) Individual Members, (2) Industry (Corporate) Members, and (3) Sustaining Members* during the period Jan 15, 1987-Jan 15, 1988 (See opposite page).

(6) Nat'l Office purchase of 100 3-ring binders and dividers, plus information inserts, packaging, and mailing costs to 100 individuals.....$1,500

(7) National underwriting of **"Trainer of the Year Award"** (Transportation of winner & spouse to Ft. Rucker, motel accommodations, luncheon/banquet tickets, and incidentals.....$1,500

(8) Underwriting of **"National President's Reception"** on opening night at the 1987 USAREUR Region—AAAA Regional Convention at Garmisch (Based on $1.50 per member as at Nov 1, 1986).....$3,967.50

(9) A "set-aside" for CY87 additional **AAAA Chapter Activity Support,** the type of expenditure and the manner of the support to be decided by the Board at its April, 1987 meeting.....$9,000

(10) An AAAA donation for the CY 87 period to the **AAAA Scholarship Foundation, Inc**.....$50,000

(11) National Office provision of a **complimentary four-inch decal** to each Renewal Member.....$1,534

(12) An AAAA donation for CY 87 to the **Army Aviation Museum Foundation Building Fund,** the donation to the tied to the Nov 1, 1986 membership..$15,340

(13) Miscellaneous National Office Member Support (Residue monies to be held in escrow to respond to the requests that develop during the year).....$2,450

Longevity Pins

Those AAAA Members who reach the 30 year membership plateau this coming April and who attend the Apr 8-12 AAAA Convention in Ft. Worth will receive their lapel pins in ceremonies at the Membership Luncheon on April 9.

Chapter Speakers

MG George W. Putnam, Jr. Jan. 12, 13, and 14

COL Albert E. Hervey Jan. 12

LTG Charles D. Franklin Jan. 13

MG Ellis D. Parker Jan. 15

COL Dennis P. Vasey Jan. 21

Each month, some six to ten key military, industry, and gov't leaders address AAAA's worldwide Chapters professionally.

AAAA Calendar

December, 1986

■■ Dec 16. Aloha Chapter. Late afternoon Reactivation-General Membership Meeting. Schofield Barracks O-Club.

January, 1987

■■ Jan 9. Lindbergh Chapter. Late afternoon prof'l-social meeting, "Australian-American Friendship Hour". Executive International Inn.

■■ Jan 12. Phantom Corps Chapter. Mid-afternoon prof'l-business meeting. MG George W. Putnam, Jr., Ret., AAAA President; COL Albert E. Hervey, Cdr, USA Safety Center, guest speakers. The Soldier's Dome, Ft. Hood.

■■ Jan 13. Washington, DC Chapter. Prof'l-social dinner meeting. LTG Charles D. Franklin, CG, First US Army, guest speaker. Ft. McNair Officers' Open Mess.

■■ Jan 13. North Texas Chapter. Early evening prof'l-social meeting. Cocktails/hors d'oeuvres. MG George W. Putnam, Jr., Ret., AAAA President, guest speaker. Arlington Sheraton.

■■ Jan 14. Corpus Christi Chapter. Professional luncheon meeting. MG George W. Putnam, Jr., Ret., AAAA President, guest speaker. NAS O-Club Ballroom.

Suspense Date

Jan. 15 was the suspense date for the submission of nominations for all CY86 AAAA National Awards and for the submission of all data by CY87 AAAA Scholarship Award applicants.

■■ Jan 15. Fort Bragg Chapter. Professional dinner meeting celebrating the activation of the 82d Combat Aviation Brigade. MG Ellis D. Parker, CG, USAAVNC, guest speaker. "Next Five Years of Army Aviation", "Safety", "The Aviation Wife". Ft. Bragg Main O-Club.

■■ Jan 21. Colonial Virginia Chapter. Professional luncheon meeting. COL Duke Vasey, Asst Cmdt, USAALS, guest speaker. Ft. Eustis Officers' Open Mess.

January-February, 1987

■■ Jan 30-Feb 1. Indiantown Gap Chapter. Ski Trip to Bristol Mountain, N.Y. w/accommodations in Rochester, N.Y.

February, 1987

■■ Feb 4-5. 13th Annual Joseph P. Cribbins Product Support Symposium sponsored by the Lindbergh Chapter - AAAA. Airport Hilton Hotel, St. Louis, Mo.

■■ Feb 6. AAAA National Awards Committee. Annual Meeting. Selection of CY87 AAAA National Scholarship Award Winners. Ft. Myer, Va.

■■ Feb 7. AAAA National Awards Committee Annual Meeting. Selection of CY86 AAAA National Award Winners (AA, Soldier, DAC, Units of the Year, McClellan Aviation Safety Award). Ft. Myer, Va.

■■ Feb 15-17. Chesapeake Bay Chapter. 3rd Annual Seven Springs Ski Trip to Seven Springs, Pa.

March, 1987

■■ Mar 15-20. AAAA Ski Week and the 1987 USAREUR Regional Convention. AFRC, Garmisch, Germany. Details available from AAAA Nat'l Office o/a Jan 21.

April, 1987

■■ Apr 8-12. 29th AAAA National Convention. Tarrant County Convention Center and five area hotels in Ft. Worth, Tex. See the centerfold of this issue for details.

Major Change

The 1987 Regional Convention will be held during the two-day, Mar 19-20 period with the Awards Banquet to be held on Nov 7, 1987 at the Regional Ball, according to COL WE Golding, the new Regional President.

The change was brought about by the inability to accommodate all Banquet attendees at the AFRC.

Stevens, Tolson, and Lasch nominated

MG Story C. Stevens, Ret. LTG John J. Tolson, III, Ret., and **COL John A. Lasch, III,** were nominated for three-year 1987-1990 elective terms on AAAA's National Executive Board.

The three were chosen by the National Nominations Committee (Past Presidents, the incumbent President, and the Executive Vice President) to take the place of **MGs George W, Putnam, Jr., Ret.,** and **Richard D. Kenyon** whose National Board terms expire on April 11, 1987.

The names of the foregoing candidates will be placed in nomination at the General Membership Meeting to be held at the AAAA National Convention, Thursday, April 10, 1987.

In addition to the above nominations, floor nominations may be made at the same meeting, provided that the name of a floor nominee appears on nomination petitions signed by twenty-five members of the Ass'n and the petitions are provided to the Chairman of the Nat'l Nominations Committee through the National Office at least thirty days prior to the conduct of the 1987 Convention.

AAAA Membership Up

The AAAA's overall membership totaled 15,650 on January 1, 1987, a gain of 244 members — 1.56 per cent — over the total on January 1, 1986.

AAAA offers three new Membership Enrollment Awards for individuals

Starting January 15, 1987 and continuing through January 15, 1988, individual members of AAAA may now compete for **individual member enrollment prizes** totaling **$650.00** in each of three separate categories.

The ***Top Recruiter*** in each category would receive a **$300.00 cash award** and if he or she chooses to attend the April, '88 AAAA Convention in St. Louis, would receive an additional prize, a **1987 Convention Underwrite** covering (1) complimentary Convention Registration, (2) a ticket to all convention food functions and receptions, and (3) a complimentary twin room Wednesday through Saturday nights at one of the Convention hotels. **Total value** (assuming Convention attendance): **$650.00.**

The separate competition categories of the Jan 15, 1987—Jan. 15, 1988 AAAA contest include:

(a) **Individual Member Enrollment.** No minimum number is required to qualify — the ***Top Gun*** takes all! A contestant's name must be placed in the appropriate box appearing on each standard AAAA Application Form.

(b) **Industry (Corporate) Member Enrollment.** A total of at least two such memberships are required to earn competition standing.

(c) **Sustaining Member Enrollment.** A total of at least five such memberships are required to earn competition standing.

The three winners will be invited to sit at the head table at the Thursday, April 14, 1988 General Membership Luncheon, and to receive their awards at that function.

CW2 William H. McCollister receives AAAA's "Trainer of Year Award"

An instructor pilot assigned to C Co, 7th ATB, Ft. Rucker, Ala., **CW2 William H. McCollister,** right, received *"Trainer of the Year for 1986"* honors at an Awards Banquet at Ft. Rucker on Dec. 4. The awardee was cited for his contributions to the OH-58D Program in which he, as the only *Stinger* IP in Aviation, trained all personnel in the test program of the *Stinger System* and its employment.

The photo (left) shows **Gordon J. Stred,** VP-Mktg, Singer Link FSD, presenting the permanent *"Trainer of the Year"* trophy to **AAAA President Putnam** who, in turn, presented it to **MG E.D. Parker,** c., for Museum retention.

Army Aviation Hall of Fame inducts new members

The newest members of the Army Aviation Hall of Fame were inducted in ceremonies held Dec. 4 at Ft. Rucker.

Four inductees were present; two were represented by family members; and a seventh was represented by a long-time business associate.

The new Hall of Fame members were:

Lawrence E. Bell, deceased, manufacturer and aviation pioneer, represented by **Bartram Kelley**, a former BHT Senior Vice President - Engineering.

GEN Frank S. Besson, Jr., deceased, represented by his son, **LTC Frank S. Besson, III, Ret.**

CW4 Robert L. Hamilton, Ret., of Los Gatos, Calif., who was accompanied by his wife, **Carol**, and his son, **David.**

CW4 Donald R. Joyce, Ret., of Newport News, Va., who attended with his wife, **Helen.**

MG Story C. Stevens, Ret., of Hilton Head Island, S.C., who was accompanied by his wife, **Sue.**

LTG John M. Wright, Jr., Ret., of Irving, Tex. The senior officer's wife, **Helene**; his sons, **LTC Richard K. Wright, USA, and John M. Wright, III**; his brother, **CPT Richard M. Wright, USN, Ret.**; and his nephew, **LT Richard M. Wright, Jr.**, USCG, also attended the ceremonies.

SFC Rodney J.T. Yano, deceased, was represented by his parents, Mr. and Mrs. Richard S. Yano of Kailua-Kona, Hawaii.

The opening remarks were made by **MG Ellis D. Parker**, Commanding General, USAAVNC, who introduced the AAAA's National President, **MG George W. Putnam, Jr., Ret.**

Background cited by President

President Putnam briefly commented on AAAA's overall sponsorship of the Hall of Fame and the election activity preceding the inductions. He then introduced **GEN Hamilton H. Howze, Ret.**, Chairman, Army Aviation Hall of Fame Board of Trustees, who, in turn, introduced each inductee and read the citation outlining the inductee's accomplishments.

Earlier, the inductees, their family members, and attending members of the Hall of Fame were AAAA guests at a small private luncheon at which the CG was the guest of honor, and then toured the Army Aviation Museum.

The inductees and their families were also honored guests at a formal banquet held the same evening.

General Hamilton H. Howze, Ret., Chair- of the Hall of Fame Board of Trustees, reading a citation describing the accomplishments of an inductee.

About the Chairman

General Hamilton H. Howze served as Chairman of the Tactical Mobility Requirements Board in 1961, and cited the need for the development of airmobile theory and doctrine. The adoption of the "**Howze Board** recommendations revolutionized mobile warfare concepts based on the use of organic aviation in much the same manner as the introduction of the tank had affected mobility concepts almost 50 years earlier.

Museum "Hall" now honors 53 individual persons

The 1987 inductees and their family members (or representatives) are shown with the Hall of Fame principals following the Dec. 4 induction Ceremonies. Front row, l-r, Bartram Kelly (representing Lawrence E. Bell), *LTC Frank S. Besson, III,* son of GEN Frank S. Besson, Jr.; *CW4 Robert L. Hamilton, Ret.; CW4 Donald R. Joyce; MG George W. Putnam, Jr.,* AAAA President; *GEN Hamilton H. Howze,* Chairman of the Hall of Fame Board of Trustees; MG Ellis D. Parker, CG, U.S. Army Aviation Center & Ft. Rucker, Ala.; *MG Story C. Stevens; LTG John M. Wright, Jr.;* and Richard S. Yano. 2nd row, l-r: David Hamilton, Mrs. Robert L. Hamilton, Mrs. Donald R. Joyce, Mrs. Hamilton H. Howze, Mrs. Story C. Stevens, Mrs. John M. Wright, and Mrs. Richard S. Yano. 3rd row, l-r: *CPT Richard M. Wright, USN;* John M. Wright, III; LTC Richard K. Wright, USA; and LT Richard M. Wright, Jr., USCG. (*The italicized names represent retired personnel.*)

LTC Frank S. Besson, III, USA (Ret.), left, the son of GEN Frank S. Besson, Jr., deceased, a former AMC Commander, stands beside his father's Hall of Fame portrait as GEN Hamilton H. Howze reads the citation describing the senior Besson's lifetime contributions to U.S. Army Aviation and to those who serve compilshments. Joseph P. Cribbins, center, a member of the Hall of Fame and the Special Assistant to the DCSLOG, DA, and MG Richard E. Stephenson, CG, U.S. Army Aviation Systems Command, and a former aide of GEN Besson early in his career, served as LTC Besson's escorts.

The Army Aviation Hall of Fame — 1974-1986

Background — Growth — Changes

The **Army Aviation Hall of Fame** was established in 1974 by the Army Aviation Association (AAAA) to honor those persons — both military and civilian — who have made outstanding individual contributions to U.S. Army Aviation and to record the excellence of their achievements for posterity.

This recognition cites each individual in a permanent display at the U.S. Army Aviation Museum located at Fort Rucker.

In 1974, Army Aviation was only 32 years old. Yet in that short span of 32 years between 1942 and 1974, a proud and distinguished record of growth and accomplishment had been achieved.

In the Hall's first year, nearly 5,000 AAAA members of five or more years standing elected seven superb individuals for induction into the Hall of Fame from a ballot that listed 17 nominees.

The 17 candidates had been chosen earlier in 1974 from more than 60 nominations received from the field by an AAAA Hall of Fame Committee selected by the Association's National Executive Board.

Under the ground rules established at the time, one individual was to be inducted for accomplishments during the period prior to the formal establishment of Army Aviation at Fort Sill, Okla., in June, 1942, and two individuals were to be selected for their achievements during each of the three succeeding decades — the '40's, the '50's,, and the '60's.

In 1975 and 1976 the same basic nomination, membership balloting, and induction procedures were followed and the distinguished membership of the **Army Aviation Hall of Fame** grew to 22 individuals.

In 1977, the AAAA's National Executive Board entrusted the management of the Hall of Fame Program to an independent, six-member **Board of Trustees** under the Chairmanship of retired General Hamilton H. Howze — who remains Chairman of that Board to this day.

Several basic changes were made that year by the Trustees in the nomination and election procedures for the Hall of Fame.

First, the newly-created **Board of Trustees** assumed full responsibility for selecting inductees from among those nominated.

Second, the selection of inductees on the

(BACKGROUND/Cont. on Page 95)

Post and AAAA officials were present at the seventh Army Aviation Hall of Fame induction ceremony. Shown, l-r, are MG George W. Putnam, Ret., President, AAAA; GEN Hamilton H. Howze, Ret.; Chairman of the Hall of Fame Board of Trustees; and MG Ellis D. Parker, Commanding General, US Army Aviation Center and Ft. Rucker, Ala.

Lawrence D. Bell

Civilian — Deceased

In 1941 Bell Aircraft Corporation was producing 400 fighter planes a month in Buffalo, New York; numerous B-29 bombers in Marietta, Georgia; and large quantities of machine gun mounts and mortar shells at its Ordnance Division in Vermont.

Despite the overwhelming duties involved in coordinating those activities, **Mr. Larry Bell** took time that year to launch development work on the first Bell helicopter. Impressed with rotary-wing inventor **Arthur Young's** advanced thinking, **Bell** added him to the company payroll. He had long recognized the potential for a machine that would not require runways.

In 1945 **Bell** announced that his company would enter the helicopter field, a bold step to take when no helicopter had yet achieved a commercial license. Only six months later, Bell's Model 47 was licensed under the CAA designation NC-1H.

Further demonstrating his commitment to the new concept, **Bell** separated helicopter operations from Bell Buffalo by building a new plant at Ft. Worth, Texas, for the helicopter division.

From its earliest days Bell's helicopter operations were closely tied to Army Aviation — the company delivering its first production-line aircraft near the end of 1946. The Army's utilization of the helicopter in Korea helped prove the concept — helicopters being used for reconnaissance, aerial supply, and medical evacuation.

In 1955 Bell won the industry competition for the Army's first production turbine-powered utility helicopter, Bell Model 204, the famous UH-1.

A measure of the man: under **Bell's** leadership, his company produced the first US-designed jet fighter, the P-59 *Aero-comet;* the world's first aircraft to exceed the speed of sound, the X-1; the first airplane to vary the sweep of its wings in flight, the X-5; and the world's first commercial helicopter.

In 1944 **Lawrence Bell** received the *Daniel Guggenheim Medal* for "achievement in design and construction of military aircraft and for outstanding contributions to the method of construction".

In 1948 he was co-recipient of the coveted *Collier Trophy* for the design, development, and production of the X-1, the world's first supersonic airplane.

In 1977, he was installed in the Aviation Hall of Fame in Dayton, Ohio.

Lawrence D. Bell died October 20, 1956, but his legacy remains.

Frank S. Besson, Jr.

General — Deceased

Frank S. Besson, Jr., was a graduate of the United States Military Academy and of the Graduate School of the Massachusetts Institute of Technology.

At the age of 34 he became the youngest Brigadier General in the Army Ground Forces while superintending in Iran the enormous flow of war materiel during World War II from the United States to the Soviet Union (**Winston Churchill** said it totaled five million tons).

After the surrender of Japan he was ordered to assume control of that country's immensely complex rail system, and according to **General Eichelberger** did the job supremely well.

He later became, inevitably, the Chief of Transportation and then the first commander of the Army Materiel Command. In these positions **Besson** recognized immediately the emerging tactical importance of Army Aviation and, with characteristic foresight and drive, proceeded to establish and develop the logistic base that would make it work.

He established the Army Aviation Depot Maintenance activity at Corpus Christi (ARADMAC), and was instrumental in securing approval for the Army to procure its own aircraft and to do its own research, development, and engineering.

To enable the Army to meet these daunting new responsibilities he placed heavy emphasis on graduate programs for his subordinate officers and civilian employees, on their education with industry, and on other schooling

that exposed the Army to the most modern industrial management techniques.

General Besson was thus responsible to a major degree for the successful development of literally all the aircraft types now flying in the Army. But much more than that, he established an Army aircraft support system which, from a most modest beginning, developed with exemplary rapidity into a highly sophisticated, effective organization.

A superb organizer, manager, and soldier, **General Besson** (measured by his accomplishments) was a giant of a man, controlling assets that ran into many billions of dollars. The selflessness with which so many dedicated themselves to the task of developing Army Aviation is perhaps the most significant tribute to his leadership. Many of Army Aviation's present and future accomplishments have or will have been made possible by his extraordinary energy, talent, and leadership.

He died, after his retirement, in Washington, D.C. in 1985.

Robert L. Hamilton

CW4 — Retired

It's rare to find a single person who has "done it all" in Army Aviation — an outstanding individual who has served with distinction in every Army Aviation assignment from crew chief to Department of the Army staffer. Such a person is **Chief Warrant Officer (W4) Robert L. Hamilton**, Retired.

A Master Aviator, Flight Examiner, Safety School Graduate, Operations Officer, combat veteran with 1,199 combat hours, bi-linguist, Personnel Specialist, fixed wing and rotary wing instrument-qualified pilot, Unit Training Officer, and Pentagon Action Officer — **CW4 Hamilton** ruly has "done it all."

Crewing an H-13 in Europe from 1954 to 1957, he attended flight school in 1958, served as an Operations Officer at Ft. Benning, and then returned to Ft. Rucker where he instructed in the Flight Examiners' Course in 1964. He served his first tour in Vietnam with the 1st Cav in 1966 and 1967 and was then assigned to the Warrant Officer Aviation Branch in Washington.

His duties included the assignment, training, and career counseling of Aviation Warrant Officers, and his advice in this field was keenly sougt by senior officers in the Office of Personnel Operations and other DA agencies.

After taking the Advanced Course, fixed wing training, and the USC Safety Course, he served a second tour in Vietnam in 1971 and 1972, where his duties at Headquarters, USARV, concerned Aviation Safety. He later flew UH-1's and U-21's.

Assigned to the Office of the Director of Army Aviation in 1972, his duties included supervision and systems management for the reseach, development, and acquisition of Life Support Equipment and the Synthentic Flight Training System (2B24).

He also assisted the Director in providing written material and briefings to Congress, the Office of the Secretary of Defense, the Army Secretariat, and the Army Staff.

An extraordinary individual with a solid career of accomplishment, **Bob Hamilton** is a 5,000-hour pilot, who holds the Distinguished Flying Cross, a Legion of Merit, and the Air Medal with 28 Oak Leaf Clusters, has always been singled out by his superiors and his peers as a leader. He's a former National Vice President of the Army Aviation Association and a former President of the U.S. Army Warrant Officers Association.

CW4 Hamilton, 3d from left, is shown with his son, David, and his wife, Carol, at the '86 induction Ceremonies at Ft. Rucker, Ala. COL John W. Marr, right, a Hall of Fame member, escorted the Hamiltons at the function. The HOF photos were taken by SP4 Kelly L. M. Longbine and SP4 Mark A. Wood of the PAO, USAAVNC.

Donald R. Joyce

CW4 — Retired

A "working aviator" who always strove to be above the best, **CW4 Don Joyce** is one of those rare individuals who, in his 26-year Army career, always sought out the training, flying assignments, additional duties, and challenging career opportunities that would exceed the "norm" expected of him.

Graduating in the first Warrant Officer Class at Camp Rucker, Ala., in April, 1955, he was among the first Aviation Warrant Officers selected for the Fixed Wing Qualification Course and was a member of the first Aviation Warrant Officer Advanced Career Course.

A solid achiever, he was Honor Graduate of his Fixed Wing Qualification Course, his AC-1 *Caribou* Qualification Course, his Rotary Wing Instrument Flight Examiners Course, and his Aircraft Maintenance Officer Course.

Don Joyce later qualified in over 30 types, models, and series of fixed and rotary wing aircraft and has also flown several Air Force and Navy aircraft on special missions and test projects.

He was awarded his Master Army Aviator Badge at the 15-year mark with 6,000 flying hours — twice the minimum requirement — and both fixed-wing and rotary-wing Special Instrument Cards. During his career he earned two Distinguished Flying Crosses and 39 Air Medals, and has flown many VIPs including **Lowell Thomas, Bob Hope,** and **Vice President Hubert Humphrey.**

On one notable occasion he self-deployed from Ft. Benning to Vietnam with his *Caribou* unit by way of Greenland, Europe, the Middle East, and Thailand.

As his Army Aviation experience grew, **CW4 Joyce** became an early spokesman for flight pay equality for Aviation Warrant Officers — volunteering his personal time, energy, and funds while serving as a national officer in both the Army Aviation Association and the Warrant Officer Association.

A highly competent journalist and unfrocked Army Aviation historian, he has still another dimension — his photo stories have been published in many military journals and papers and most recently in Time-Life's *Vietnam Experience.*

Army Aviation and the Aviation Warrant Officer have been his life throughout his career. Controversial at times, dedicated always, and ready whenever duty has called, his demonstrated aviation expertise and meritorious conduct make him a proud addition to the Army Aviation Hall of Fame.

Story C. Stevens

Major General, Retired

"Unquestionably the Army's most experienced and expert commander and manager in the full spectrum of Aviation acquisition." So said **General John R. Guthrie,** AMC Commander, in describing **Major General Story C. Stevens.**

A Master Army Aviator, **Stevens** planned, established, and commanded the U.S. Army Aviation Research & Development Command — now the Aviation Systems Command — for eight key years during which the entire present generation of Army aircraft — the *BLACK HAWK, APACHE, CH-47D CHINOOK,* and *AHIP* — were developed, tested, and initially fielded.

Under his leadership a number of advanced development programs produced noteworthy technical improvements in the areas of composite structure, fuel efficient turbine engines, survivable digital electronics, and reconfigurable flight control systems.

As a result of his efforts, the Army had "hands on" experience with the *Advancing Blade Concept* and *Tilt Rotor Research Aircraft.* He also fostered the joint acquisition with NASA of the *Rotor Systems Research Aircraft* and a fleet of test vehicles representing the spectrum of Army configurations.

His convincing support for tilt rotor technology was a key factor in the initiation of the *JVX* program which is nearing maturity. Working closely with his colleagues at the Training and Doctrine Command, he laid the groundwork for the Army's *LHX* program.

Employing a unique style of management wherein his subordinates enjoyed both professional freedom and total support, **Story Stevens** was responsible for AVRADCOM becoming a model command for creativity, innovation, and teamwork.

His major program accomplishments were the successful development, qualification, and fielding of long-life fiberglass rotor blades for AH-1S and CH-47D aircraft; the lifesaving wire strike protection system; radically new procurement strategies for the AHIP Program; completion of the CH-47D Program on cost and on schedule; and the development of Aircraft Survivability Equipment providing a greatly increased probability of successful mission accomplishment.

During his career, the 1951 graduate of San Marcos AFB Army flight training served as an Army Aviator in Korea, Japan, Alaska, Vietnam, Germany, and CONUS, and directed Aviation Staffs at both AMC and HQDA.

With more than three decades of Army Aviation leadership, and his lasting contributions in aviation research and development, **Story Stevens** is a highly qualified candidate for early induction into the Army Aviation Hall of Fame.

John M. Wright, Jr.

Lt. General, Retired

A highly respected commander and staff officer who served in his final assignment as Comptroller of the Army on the General Staff, **Lieutenant General John M. Wright, Jr.** was, first and foremost, a leader.

An aviator with considerable combat experience, he was the Assistant Division Commander of the 11th Air Assault Division (Test) at Ft. Benning, Georgia, during the 1964-1965 period. He provided strong leadership and guidance during the extensive testing of the division's units and equipment which resulted in the adoption of such a division by the Army.

As the ADC of the 1st Cavalry Division (Airmobile) in Vietnam during 1965-1966, he personally engineered the clearing of a division base in the jungle near An Khe, retaining the area's grass in order to reduce the dust problems generated by the hundreds of helicopters to be stationed there.

He dubbed this world's largest helipad, "The Golf Course." It soon became famous, and his foresight paid off for all the aviation personnel who operated from this heliport in the ensuing years.

Throughout this period he was a most important member of a division which proved in combat that it could do all of the things the Howze Board had hoped it could do — and more.

In 1966, **General Wright** was appointed by the Army Chief of Staff to direct a study entitled "*Aviation Requirements for the Combat Structure of the Army*" — which became the blueprint for the future development of Army Aviation.

During 1967-1969, he served as Commandant of The Infantry School, where he established programs to ensure that ground commanders were aware of the capabilities and limitations of air assault tactics and techniques developed in Vietnam.

In 1969 **Jack Wright** returned to Vietnam as Commanding General, 101st Airborne Division (Airmobile). His extensive experience with the 11th Air Assault Division and 1st Cavalry Division enabled him to maximize the unique capabilities of unit and to develop new air assault tactics and techniques.

Not a chairbound leader, **General Wright** was awarded the Distinguished Flying Cross and the Air Medal with 59 Oak Leaf Clusters. The 1st Cavalry Division and the 101st Airborne Division were each recognized as the "*Outstanding Aviation Unit of the Year*" by the Army Aviation Association while he served with them in Vietnam.

Constituency of the Army Aviation Hall of Fame*

Generals	2	Lieutenant Colonels	3	CSMs	1
Lieutenant Generals	4	Majors	6	SFCs	1
Major Generals	4	CW4s	4	DACs	1
Brigadier Generals	2	CW3s	1	Civilians	6
Colonels	14	CW2s	3	*Citation Rank or Grade	

Rodney J.T. Yano

SFC — Deceased

SFC Rodney J.T. Yano was an Aircraft Technical Inspector in the Air Cavalry Troop of the 11th Armored Cavalry Regiment. He enlisted in the Army at age 17 in 1961. Described as a superb soldier, he spent his entire time in the service in the aircraft maintenance field.

He rose to the rank of Sergeant First Class and was an invaluable member of the aviation team. A wonderfully bright and well liked young soldier, his untimely death in combat on January 1, 1969 was mourned by everyone who knew him.

His posthumous citiation for the Congressional Medal of Honor states that he "distinguished himself on 1 January 1969 while serving with the Air Cavalry Troop, 11th ACR, in the vicinity of Bien Hoa, Republic of Vietnam. **Sergeant Yano** was performing the duties of crew chief aboard the troop's command-and-control helicopter during action against enemy forces entrenched in dense jungle.

From an exposed position in the face of intense small arms and antiaircraft fire he delivered suppressive fire upon the enemy forces and marked their positions with smoke and white phosphorus grenades, thus enabling his troop commander to direct accurate and effective artillery fire against the hostile emplacements.

A grenade, exploding prematurely, covered him with burning phosphorus, and left him severely wounded. Flaming fragments within the helicopter caused supplies and ammunition to detonate. Dense white smoke filled the aircraft, obscuring the pilot's vision and causing him to lose control.

Although having the use of only one arm and being partially blinded by the initial explosion, **Sergeant Yano** completely disregarded his own welfare and began hurling blazing ammunition from the helicopter. In so doing he inflicted additional wounds upon himself, yet he persisted until the danger was past. **Sergeant Yano's** indomitable courage and profound concern for his comrades averted loss of life and additional injury to the rest of the crew. By his conspicuous gallantry at the cost of his own life, in the highest traditions of the military service, **Sergeant Yano** has reflected great credit on himself, his unit, and the United States Army."

Background

(Continued from Page 90)

basis of contributions during a specific time period was discontinued, as was the predetermination of the number of people to be inducted in any given year.

Third, following the 1977 ceremonies, inductions were to be held on a triennial basis starting in 1980.

Finally, persons serving on active duty in the armed forces, other than DACs, would be ineligible for consideration until after their separation or discharge.

Under these new ground rules, seven more distinguished individuals were inducted into the Hall of Fame in 1977, bringing the total membership up to 29.

The fifth induction Ceremony took place during the 1980 AAAA National Convention in Atlanta, Ga., and represented the first time that such ceremonies were held outside of Fort Rucker.

The most recent inductions took place in April, 1983 — once again at an AAAA National Convention held in Atlanta.

As the Hall of Fame program developed over the years, there were additional procedural changes:

. . the 1986 induction ceremony has returned once more to Fort Rucker;

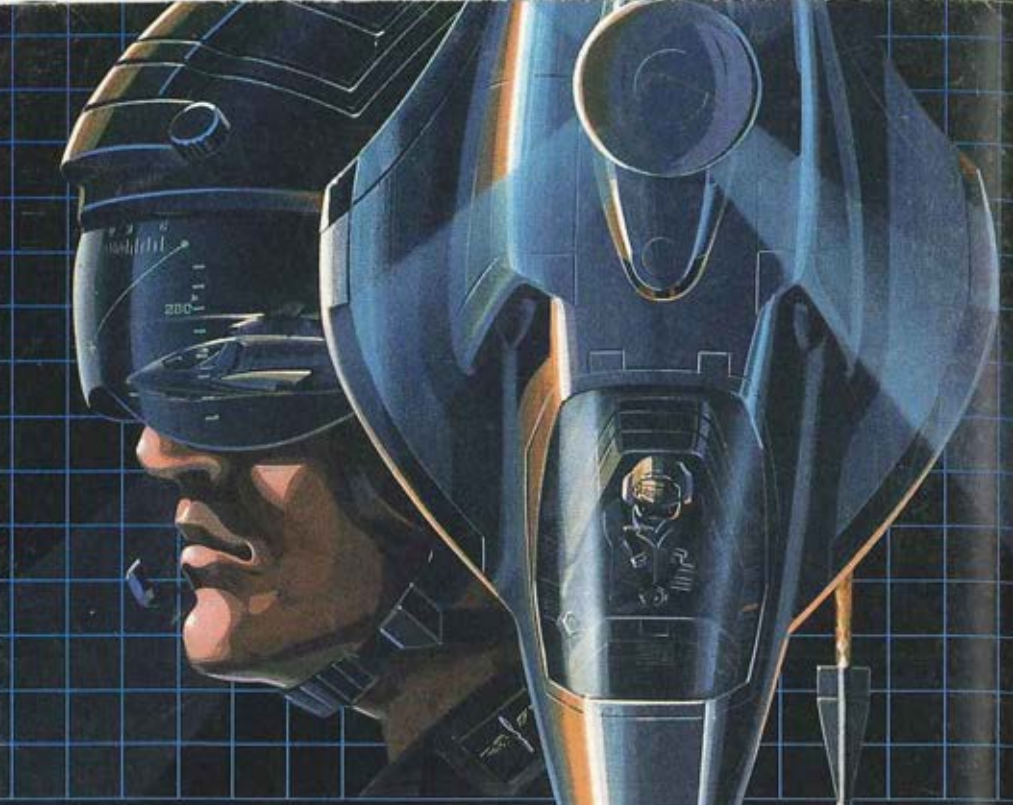
. . the Hall of Fame Board of Trustees has grown to include eight members;

. . and the actual selection (election) of the inductees has again been returned to the hands of the long-term members of AAAA.

In mid-1986, more than 60 Hall of Fame nominations were submitted from the field. The Board of Trustees narrowed down the list of 60 to 22 candidates during its April, 1986 meeting in Atlanta.

In July, nearly 3,500 AAAA members with seven or more years of consecutive membership received **"Hall of Fame Ballots"** in the mail and were asked to vote for **seven** of the 22 nominees for December, 1986 induction into the **Hall of Fame.**

The individuals honored in December brought the current membership in the **Army Aviation Hall of Fame** to 53.



LHX.
The perfect union of man and machine.

Our goal: the lowest workload in the most lethal helicopter ever built for the U.S. Army — LHX, a machine for tomorrow's AirLand Battles.

McDonnell Aircraft Company, the world's leader in fully integrated single-pilot combat aircraft, is joining the world's leaders in *scout* and *attack* helicopters: Bell Helicopter Textron and McDonnell Douglas Helicopter Company. *This* is the SuperTeam for LHX.

LHX is indeed a machine for tomorrow, but we're flying the aircraft today, in full combat mission simulators, *years* before the first prototype rolls onto the flight ramp.

This is the beginning of a breakthrough.

LHX
MCDONNELL DOUGLAS HELICOPTER
SUPERTEAM
BELL HELICOPTER TEXTRON