SPECIAL JANUARY FEATURE — TODAY'S AHIP PROGRAM

Army Aviation

JANUARY 15,1982

SPECIAL FEATURE — TODAY'S AHIP PROGRAM — P. 17
1982 AAAA NATIONAL CONVENTION DETAILS — PAGE 10

Army Aviation

JANUARY 15, 1982

ARMY AVIATION
A professional journal endorsed by the Army Aviation Association of America (AAAA)

Publisher
Arthur H. Kesten

Associate Editors
Terrence M. Coakley
Susan Leslie Bruno

Prod'n Assistants
Dorothy Halasz
Mary Ann Stirling
Debby Coley

Business Manager
Dorothy Kesten

Fulfillment Manager
Jill Thomas

Advertising Manager
Peter M. Stern
Display and classified advertising rates are listed in SRDS Business Publications, Classification 90.
Telephone (Advertising only): (203) 372-5934.

SUBSCRIPTION DATA
ARMY AVIATION (ISSN 0004-248X) is published monthly, except March and December by Army Aviation Publications, Inc., 1 Crestwood Road, Westport, Conn. 06880. Phone: (203) 226-8184 and (203) 226-0487.

Subscription rates for non-AAAA members: $12, one year; $22, two years; add $7.50 per year for foreign addresses other than military APO's.

The receipt of change of addresses is verified by the publication of the residence change in the PCS or "Takeoffs" column of the magazine.

Second Class postage paid at Westport, Conn.

APACHE . . .
Field Tested Tough

The U.S. Army/Hughes AH-64A "APACHE's" on-time, on-schedule completion of the Army's Operational Test II milestone proved its troop compatibility with hands-on operation by Army personnel.

During this final demanding three-month long test, in hot (temperatures up to 114°), dusty conditions, the AH-64A demonstrated outstanding mission reliability. With all maintenance performed by Army personnel, maintenance-man-hours per flight-hour and other operational characteristics significantly bettered the stringent requirements for the Army's new anti-armor system.

In OT II Army pilots logged over 400 flight hours in day/night operations of AH-64A's, bringing development flight test time to over 3,200 hours. The APACHE . . . fully tested . . . transitioning to production.

Hughes Helicopters, Inc.
Ahead of TIME Technology

Transitioning to Production

by Brig. Gen. James M. Hesson

Attend the AAAA's "Best Ever" National Convention in April!

AS the President of the **Lindbergh Chapter** of the Army Aviation Association of America, I want to take this opportunity to voice the enthusiasm of all 388 members of our Quad-A Chapter by inviting you to St. Louis for the 1982 "Best Ever" AAAA National Convention.

COURTESY: THE ST. LOUIS SCENE

The 2½-day gathering will take place during 22-25 April at the Chase Park Plaza Hotel here in St. Louis with the convention theme being "St. Louis: Gateway to Army Aviation — Yesterday, Today, and Tomorrow."

Multi-Command effort

We are combining the talents and efforts of the **Aviation Research and Development Command (AVRADCOM)** and the **Troop Support and Aviation Materiel Readiness Command (TSARCOM)** located in St. Louis to insure that you will attend one of the most professionally rewarding AAAA conventions ever held.

ABOVE: BG James H. Hesson, Dep Cdr. USATSARCOM, and Chairman of the Presentations Subcommittee, 1982 AAAA National Convention.

This is the first time an AAAA National Convention has ever been held in St. Louis. Concurrent with our efforts to support this national activity — which started last June, we're conducting a massive membership drive and fully expect the **Lindbergh Chapter,** now No. 3 in membership, to displace one (if not both) of the two top AAAA chapters by mid-April. Members of the **Washington, D.C.** and **Army Aviation Center Chapters** may consider this as a challenge . . .

We've scheduled the convention to tie in to other planned AAAA and TSARCOM activities which will enable many attendees to get the most bang for their bucks. Prior to the convention, the Joseph P Cribbins 1982 **Product Support Symposium (PSS)** will be held at the Chase Park Plaza Hotel on 21-22 April. The **Worldwide Aviation Logistics Conference (WALC)** follows during 26-30 April.

Registration Opened

The **Advance Registration Form** and a draft of the **1982 Convention Program** are found on pages 10 and 11. Mark your calendar now, and we in the **Lindbergh Chapter** look forward to seeing you this April in St. Louis.

The CH-47D. Meeting schedules to meet the need.

From the beginning, the Army's new CH-47D Chinook helicopter has met or beaten every developmental schedule... cost, time, performance. First flight was under budget and ahead of schedule. Developmental program completion continued the pattern. And prototypes met or exceeded every design goal.

Now, production is underway, upgrading Chinook As into new, high performance, high reliability models. It will continue until the entire fleet of 436 A, B, and C models is remanufactured with more reliable engines, new transmissions, fiberglass rotor blades, and modern electrical, hydraulic, and avionic systems.

Not only will the Army be getting the increased performance it needs at lower operating costs, but American taxpayers will be saved millions of dollars in investment cost. Upgrading this well-conceived and thoroughly proven design means the Army's workhorse helicopter will continue to serve with distinction into the next century. Most importantly, it means the ground commander will be getting modern, effective, logistical support. It's the result of teamwork... Boeing and Army commitment to meeting tomorrow's needs with the right equipment at the right time. The Chinook CH-47D. Meeting schedules to meet the need.

BOEING VERTOL HELICOPTERS
THE LEADING EDGE
Philadelphia, Pa. 19142

Army Aviation Association

1 Crestwood Road, Westport, CT 06880 — (203) 226-8184

Having just completed our mid-winter National Executive Board meeting in St. Louis — and doing so at the site of our forthcoming 1982 National Convention, I'm very heartened by AAAA's prospects in many areas. For one, the Chase Park Plaza is a first class convention facility, and the staff of that hotel has bent over backwards to make certain that we'll have the very best in facilities, rates, and service. Everything checks out on the positive side . . the meeting rooms, exhibit halls, ballrooms, parking areas, and hospitality suites. All that we need is your presence!

We were briefed thoroughly by Brig. Gen. "Jim" Hesson, our Presentations Subcommittee Chairman, on his day-and-a-half of professional programming, and we can assure you that his theme, "Army Aviation — Yesterday — Today — Tomorrow", will be covered in great detail by more than 20 key members of the Army Aviation community, and will be a program in which you will have a very high interest.

Drawn largely from the personnel of TSARCOM and AVRADCOM, the members of the AAAA's Lindbergh (St. Louis) Chapter are most enthusiastic about the prospects of hosting AAAA's first ever, "Best Ever" convention in St. Louis. The "Best Ever" label is theirs . . . they have that much confidence . . . and after listening to many of them the past few days, I'm a believer. Keep your April 22-April 25 dates open for Quad-A!

John W. Marr
COL, USA (Ret.)
President, AAAA

SCIENCE/SCOPE

A telescopic sight for U.S. Army helicopter gunners is now in full-rate production at Hughes. The gyro-stabilized sight, called the Laser Augmented Airborne TOW (LAAT) sight, is used to direct TOW anti-tank missiles, cannon fire, and rockets from AH-1S Cobra attack helicopters with pinpoint precision.

It calculates the distance to a target based on the time it takes a laser burst to reach the object and bounce back. It feeds this figure almost instantaneously into the Cobra's fire control computer. The sight's laser transmitter is one of the smallest ever developed for production.

A safely concealed gunner could guide a missile toward a battlefield target with a new fiber-optic communications system. The concept calls for a missile with an imaging seeker in its nose to be fired toward an enemy force. What the missile sees is relayed back to the gunner over a glass thread that pays out from a spool in the missile's aft end. The cable, unlike ordinary wire, can transmit broadband signals required for video.

The gunner looks at a display and picks a target. Guidance commands are transmitted automatically to the missile over the fiber-optic link. Hughes and principal subcontractor ITT Electro-Optical Products Division are developing the Integrated Fiber-Optic Communications Link for the U.S. Army for possible use in a low-cost anti-armor missile.

ARMY AVIATION ASSOCIATION

JOIN YOUR FELLOW MEMBERS AT THE 1982 NATIONAL CONVENTION OF THE ARMY AVIATION ASS'N THIS APRIL 22!

Six 1981 AAAA National Awardees Cited

25 Outstanding Professional Presentations

An AAAA Exhibit Hall with over 100 booths

10 Chapter Hospitality Suites-3 Receptions

AAAA's Silver Anniversary Luncheon

Prof'l Theme: Army Aviation in St. Louis. Yesterday — Today — Tomorrow

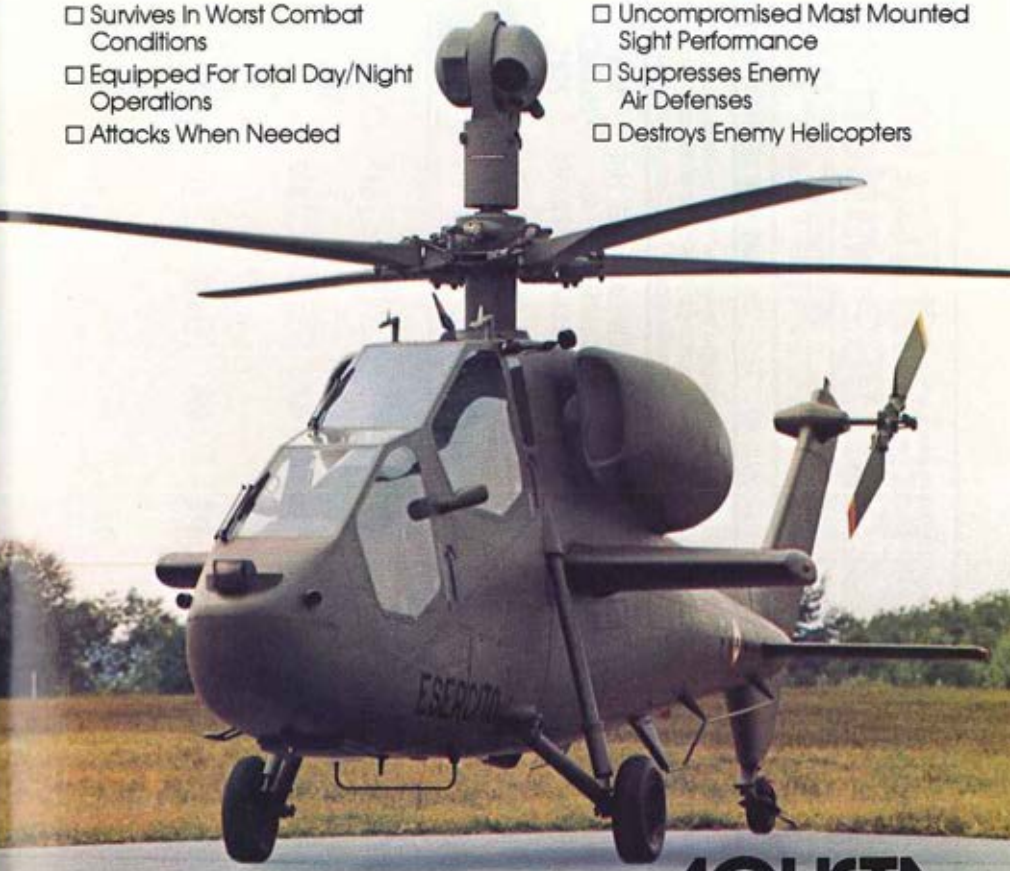
An Army Aviation Reunion? Yes, a big one!

AVRADCOM/TSARCOM talents and effort

Join us at the Chase Park Plaza Hotel!

A129 The Most Advanced Scout Helicopter

- ☐ Survives In Worst Combat Conditions
- ☐ Equipped For Total Day/Night Operations
- ☐ Attacks When Needed
- ☐ Uncompromised Mast Mounted Sight Performance
- ☐ Suppresses Enemy Air Defenses
- ☐ Destroys Enemy Helicopters



. . . NATO Partner to the U.S. Helicopter Industry.

AGUSTA

Helicopter Division

21017 Cascina Costa
di Samarate
(VA) Italy

Represented in North America by:
Italian Aircraft Corp.
Arlington, Virginia 22202

Advance Registration Form for AAAA's 1982 National Convention — April 22-25

THE CHASE PARK PLAZA HOTEL, 212 NORTH KINGSHIGHWAY, ST. LOUIS, MO 63108 — THURSDAY, APRIL 22, 1982 THROUGH SUNDAY, APRIL 25, 1982

I plan to attend the functions of the 1982 AAAA NATIONAL CONVENTION indicated below and have enclosed a check made payable to "AAAA" to cover the costs of my attendance and the function tickets. I understand advance registration closes Wednesday, April 14; and that I may receive a full refund by phone call to AAAA made on or before that date, or by written notification to AAAA that's postmarked not later than April 14, 1982.

SPECIFIC FUNCTION HELD AT THE 1982 AAAA NATIONAL CONVENTION	MIL/DAC MEMBER FEE	CIVILIAN MEMBER FEE	MIL/DAC CHAPTER DELEGATE	CIVILIAN CHAPTER DELEGATE	FEE FOR ALL SPOUSES	NON-MEMBER FEE*	ITEM LINE TOTAL
REGISTRATION (NEEDED FOR ADMITTANCE TO AAAA PROF'L SESSIONS)	☐ $12	☐ $30	☐ $8	☐ $26	N/A	☐ $27 Mil. ☐ $45 Civ.	$_____
FRIDAY, APRIL 23 SPOUSE'S MINI BREAKFAST	_____				☐ $5	_____	$_____
FRIDAY, APRIL 23 AAAA SILVER ANNIVERSARY LUNCHEON● (INFORMAL)	☐ $12	☐ $16	☐ $8	☐ $12	☐ $12	Mil/Civ As Applic.	$_____
FRIDAY, APRIL 23 PRESIDENT'S RECEPTION (FINGERTIP BUFFET)	☐ $9	☐ $15	☐ $6	☐ $12	☐ $9	Mil/Civ As Applic.	$_____
SATURDAY, APRIL 24 SPOUSE'S ST. LOUIS SIGHT-SEEING TOUR (INCL. WINE)	_____	_____			☐ $14	_____	$_____

SATURDAY, APRIL 24 KINGSIZE BOX LUNCHEON. . . . (COMPLIMENTARY BUD)**	☐ $7	☐ $9	☐ $5	☐ $7	☐ $7	Mil/Civ As Applic.	$_____
SATURDAY, APRIL 24 AWARDS BANQUET RECEPTION. AND AWARDS BANQUET★	☐ $25	☐ $40	☐ $20	☐ $35	☐ $25	Mil/Civ. As Applic.	$_____
SUNDAY, APRIL 25 CHAMPAGNE BRUNCH●. . . . . (FULL SIT-DOWN SERVICE)	☐ $7	☐ $12	☐ $5	☐ $10	☐ $7	Mil/Civ As Applic.	$_____
BOOK OF 8 COCKTAIL TICKETS. . (TICKETS, $2.25 EACH)	☐ $18	☐ $18	☐ $18	☐ $18	☐ $18	☐ $18	$_____
TOTAL.	$_____	$_____	$_____	$_____	$_____	$_____	$_____

RANK/NAME AS DESIRED ON BADGE

SPOUSE'S NAME

UNIT OR FIRM. . . . . .

ADDRESS. . . . . .

CITY STATE ZIP

*Includes $15.00 First Year AAAA Membership Dues. ●Unreserved Seating at 10-Seat Tables with Table Service. ★Formal/Black Tie, Dark Business Suit. **Served in Exhibit Hall. NOTE: "Military Member" Fees apply only to Active Army, Reserve Component, DAC Personnel, and those 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 your check payable to "AAAA," and mail with this Advance Registration Form to AAAA, 1 Crestwood Road, Westport, Connecticut 06880.

FOR OFFICE USE ONLY: A ___ ___ ___
AM'T OF CHECK $_____ B ___ C ___
DATE _____

S. California members view Columbia landing

THE **Southern California Chapter** of AAAA held a special meeting at the **Army Aviation Engineering Flight Activity (AEFA),** Edwards Air Force Base, California, on 14 November 1981.

The occasion was the landing of the Space Shuttle Orbiter, **Columbia.**

Over 500 people attended the AEFA open house and had a ringside seat for **Columbia's** landing. AEFA pilots and crewmembers, with the cooperation of the California National Guard (ARNG) played an important role during the shuttle landing.

Over 200,000 present

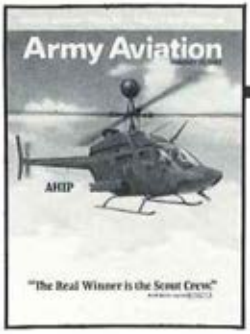
With a crowd estimated to number over 200,000, four UH-1H ARNG helicopters were responsible for assisting Air Force ground security units in crowd control and shuttle security. AEFA pilots assisted the ARNG crews and provided two UH-1H helicopters specially configured for a special mission.

The airborne TV pictures of the shuttle that were made immediately after its landing on the lake bed were taken from one of those specially configured helicopters. The helicopter-mounted TV camera and signal transmitter supplied NASA and the nation with the first close-up pictures of the shuttle.

The California ARNG, from both Stockton and Los Alamitos Aviation

(S. CALIF./Continued on Page 88)

Left: The Army photo helicopter approaches the space shuttle on the lakebed. Inset: COL Lewis J. McConnell, AAAA's S. California Chapter President (left), points out the landing runway on the Edwards AFB map to (L to R) CPT Loran Haworth (VP, Prog), LTC Jim Brown, Ret. (SrVP), and Greg Potter (Trea).

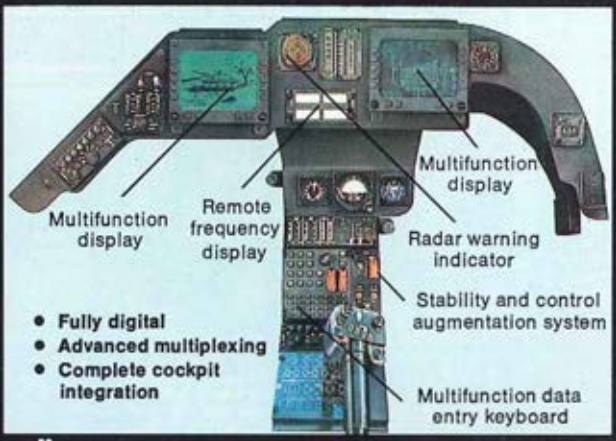


This issue's nineteen authors

Sperry's integrated cockpit keeps scout crews flying heads up.

Sperry's controls-displays system will let AHIP crews spend more time looking **outside** the cockpit to locate targets, avoid threats, and make full use of terrain.

How can we help *you*? Write Sperry Flight Systems, Box 9200, Albuquerque, NM 87119. *We understand how important it is to listen.*



SPERRY
FLIGHT SYSTEMS

DEFENSE SYSTEMS DIVISION

SPERRY FLIGHT SYSTEMS IS A DIVISION OF SPERRY CORPORATION

This issue's nineteen authors

Page 38
Representing the user
by Colonel Robert S. Fairweather, Jr., TRADOC System Manager for Scout Helicopters (TSM-SH)

Page 65
Reliability and Readiness
by Victor W. Weiner, Chief of the Product Assurance Division of the ASH Project Manager's Office

Page 50
AHIP meets the requirements
by John A. McLaughlin, Chief of the ASH Project Manager's Office Technical Management Division

Page 71
The AHIP scout helicopter's team
by Colonel Robert S. Fairweather, Jr., TRADOC System Manager for Scout Helicopters (TSM-SH)

Page 50
AHIP meets the requirements
by Melvin W. Jackson, Mission Equipment Engineer, ASH Project Manager's Office

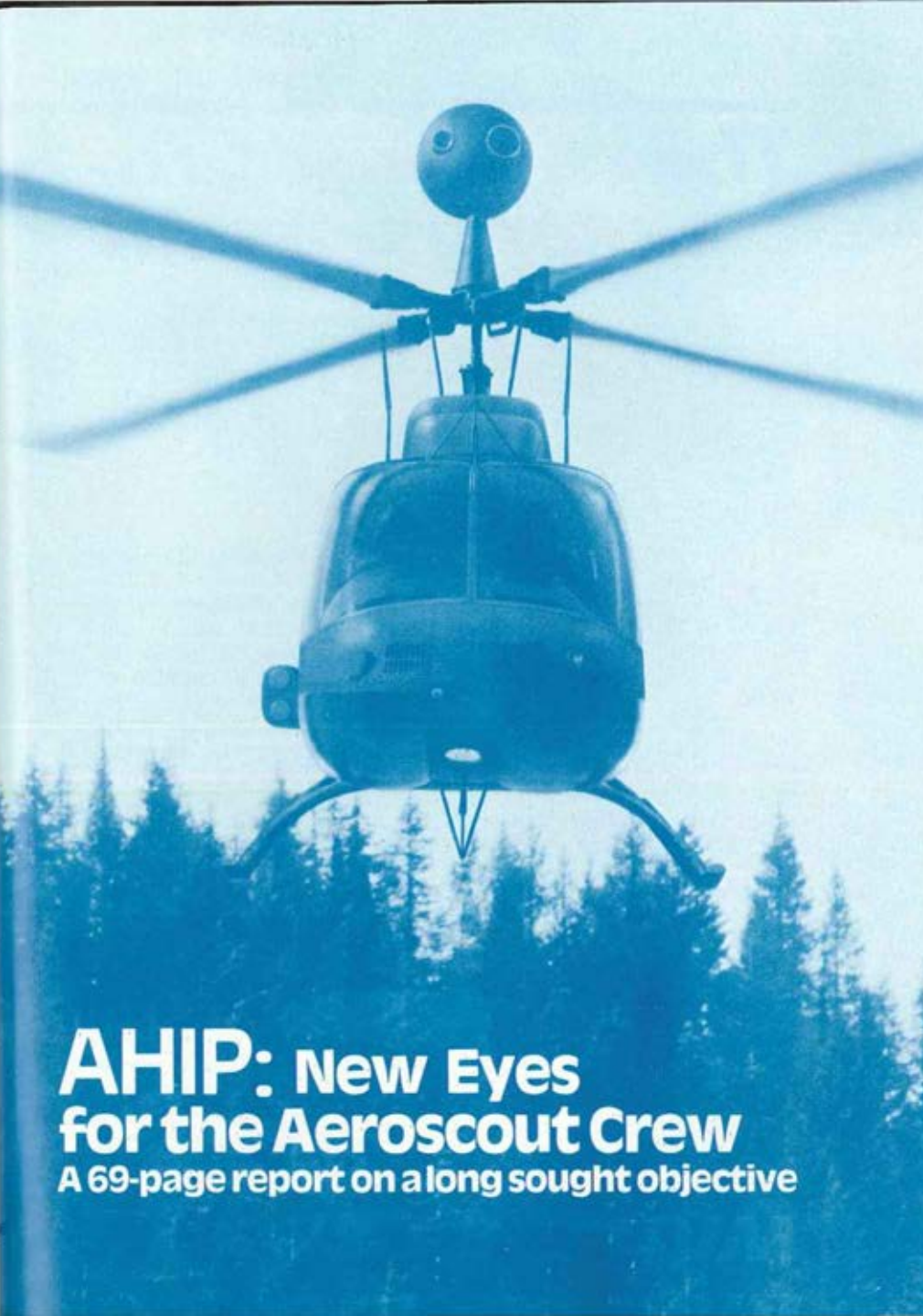
Page 74
The role of the project manager
by Earl T. Gatlin, Chief of the Program Management and Operations Division, ASH Project Manager's Office

Page 50
AHIP meets the requirements
by Darrell L. Harrison, Air Vehicle Engineer, ASH Project Manager's Office

Page 83
AHIP gets the nod of approval
by Major Charles M. Stancil, Dept. of the Army System Coordinator for the Army Helicopter Improvement Program

Page 65
Reliability and Readiness
by John A. Bartin, Chief of the Logistics Management Division of the ASH Project Manager's Office

Page 6
A good idea whose time has come
by Colonel John W. Marr, Ret., President, Army Aviation Association of America



AHIP: New Eyes for the Aeroscout Crew

A 69-page report on a long sought objective

by GEN E.C. Meyer

The challenge: To counter the threat

ONE of our Army's most pressing needs is to improve our equipment's capability so that we are better able to meet threats to our vital national interests around the world.

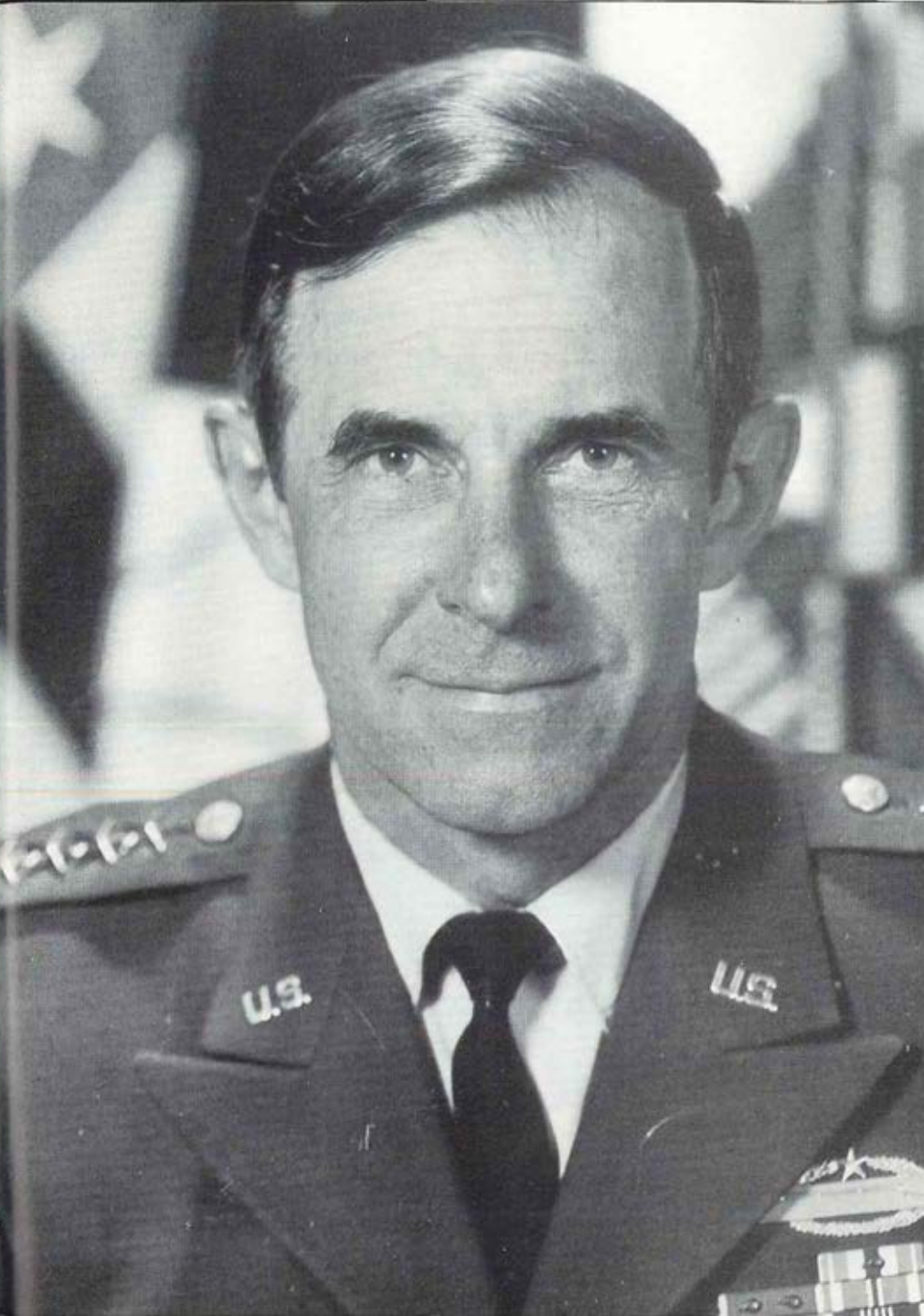
Toward that end I want to congratulate those who have successfully launched the **Army Helicopter Improvement Program (AHIP).** The start up of a new Army development program can and should be an exciting time for all involved; especially when the program happens to be one of aviation modernization that has been on the drawing board for a number of years and shows such outstanding promise.

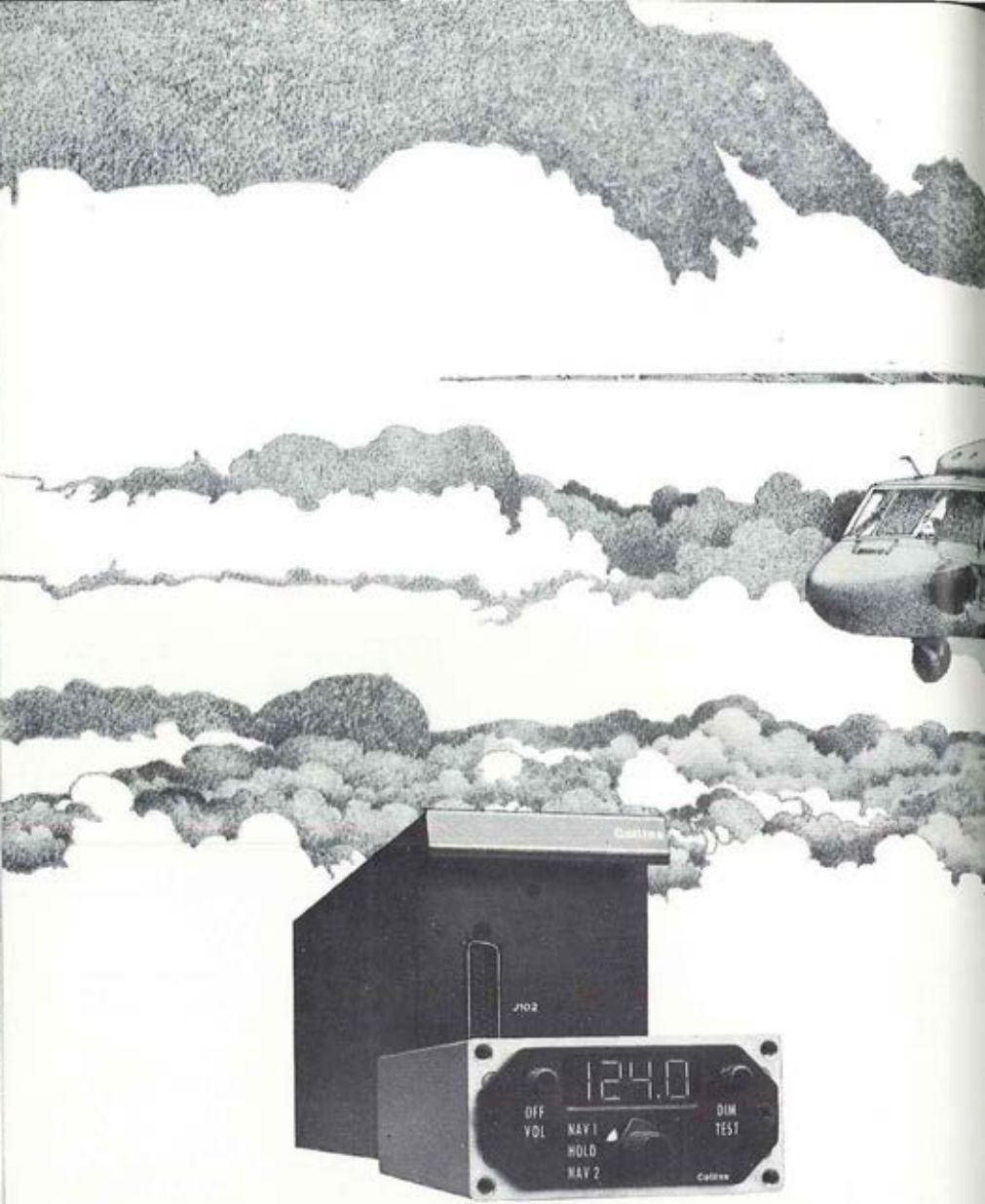
While I congratulate those of you who will participate in this program, I would at the same time offer each of you a caution couched as a challenge. Whatever the system design ultimately fielded, it must be reliable and fully capable of worldwide employment. The proof of that pudding will come not from designers, developers, technicians, project managers, or corporate and Army leadership. It can only come from the user — the Soldier who puts his faith in and bets his life on the equipment we provide him.

The challenge then is to ensure that the AHIP incorporates the latest in needed technology to counter the threat and to ensure Soldier survivability on any future battlefield. Additionally it must do so in a manner enabling it to be operated and maintained by the Soldier who puts his trust in its capabilities.

ABOUT THE AUTHOR

OFTEN REFERRING TO HIMSELF AS "THE WORLD'S GREATEST LIVING NON-RATED AVIATOR," ARMY CHIEF OF STAFF GENERAL EDWARD C. MEYER EXPECTS, DEMANDS, AND GETS AVIATION PROFESSIONALISM.


U.S.
U.S.



Collins AN/ARN-124 DME. Helps IFR missions go the distance.

The AN/ARN-124 DME has powerful credentials for improving IFR flight capabilities and mission performance for fixed and rotary wing aircraft.

Take reliability, for instance. Forty years of Collins nav experience and solid-state microprocessor technology team up for predicted field MTBF of 1,800 hrs.

Accuracy? .2NM at slant range up to 250NM from VOR/DME, VORTAC and ILS/DME stations. Echo protection. DME hold. Growth capability to interface with upcoming tactical MLS. Add a Collins BRG-40 and you have a lightweight TACAN.

Expect low life cycle costs, too. AN/ARN-124 is designed for easy maintenance using existing test equipment.

Small wonder Collins AN/ARN-124 is now the standard for the U.S. Army.

Like to give your IFR missions a good measure of success? Contact Collins Government Avionics Division, Rockwell International, Cedar Rapids, Iowa 52406. 319/395-4025.

Rockwell International

...where science gets down to business

by BG Ellis D. Parker

Recognizing the aeroscout need

The Army has long recognized the need for an improved aeroscout. In 1980, the decision was made by Department of the Army to modify an existing Army scout helicopter and equip it with a mast mounted sight and other mission equipment to serve as an interim scout helicopter.

This decision quickly led to the birth of the **Army Helicopter Improvement Program's (AHIP)** aeroscout. The first major step was to conduct a design competition for selection of a contractor to accomplish **Full Scale Engineering Development (FSED).** On September 21, 1981, a contract award to **Bell Helicopter Textron (BHT)** was announced.

This significant milestone for the AHIP was achieved only after much hard work involving many people. The **Army Aviation Research and Development Command (AVRADCOM)** translated the HQDA-approved **Required Operational Capability (ROC)** into military specifications and, after extensive interface with the TSM for the Scout Helicopter and the user community, a **Request For Proposal (RFP)** was released to industry in January 1981.

Two proposals were received: Bell Helicopter Textron responded with a modified OH-58A, and Hughes Helicopters, Inc. submitted a modified OH-6A. Both proposals were equipped with a mast mounted sight and the required mission equipment.

The proposals were subsequently evaluated by the AHIP **Source Selection Evaluation Board (SSEB).** Experienced aeroscout aviators, technicians, and selected experts in related fields were provided by FORSCOM, TRADOC, DARCOM, and other agencies to make up the SSEB. Their five month evaluation of the proposal culminated in the Army Source Selection Authority awarding the FSED contract to BHT.

The function of the AHIP scout helicopter is to provide the capability to perform reconnaissance, standoff target acquisition, and target designation missions for attack helicopter, air cavalry, and field artillery units. It will be capable of operation and target detection during day and night, adverse weather, and periods of reduced visibility.

In attack and air cavalry units, it will conduct reconnaissance and surveillance operations independently, or in conjunction with other scouts or attack helicopters detect and designate targets at standoff ranges for attack helicopters to fire their **HELLFIRE** missiles and other weapon systems; provide security and protection

ABOUT THE AUTHOR
A MASTER ARMY AVIATOR, A VETERAN OF 25 YEARS' SERVICE, AND A HOLDER OF A DFC, BRIGADIER GENERAL ELLIS D. PARKER SERVES AS THE DEPUTY DIRECTOR OF REQUIREMENTS AND ARMY AVIATION OFFICER AT DA.

for the scout/attack teams; and accomplish battlefield management tasks.

As a **Field Artillery Aerial Observer (FAAO)** scout, it will acquire and designate targets for attack by COPPERHEAD, and adjust conventional field artillery fires. The FAAO scout can also accomplish a wide variety of artillery related reconnaissance, surveillance, and firepower management missions.

To enhance the mission performance of the scout crew, the AHIP comes with a highly effective mission equipment package. The mast mounted sight enables the scout to remain masked while acquiring and designating targets. The laser designator incorporated in the mast mounted sight enables the crew to designate and provide terminal guidance for both COPPERHEAD rounds and HELLFIRE missiles.

Communications will be enhanced with improved radios and messages can be transmitted by data-burst to enhance the automatic target handoff system. Navigation will be easier and more reliable with the visual map display and attitude and heading reference systems.

Many combat enhancements

Other combat enhancing improvements are also incorporated in the AHIP. The four-bladed rotor system, larger tail rotor, and more powerful engine and transmission provide the agility needed for the scout mission, and sufficient power for worldwide operations.

Initially, Bell Helicopter Textron will produce five prototypes, three of which will be used in the **Operational Test II (OT II)** in early 1984. Initial delivery of AHIP airframes will begin in late 1985, for fielding in 1986.

Current fielding plans fill AH-64 attack helicopter and air cavalry units, divisional field artillery sections, and a few of the higher priority AH-1S units. Although production of the AH-64 Attack Helicopter will initially lead the AHIP, AHIP production will eventually catch up. The force structure will not require modification with the fielding of the AHIP since the affected units are already in place and the fielding plan consists of a one-for-one exchange of equipment.

The AHIP is designed to be maintained within the existing maintenance system. Using the three level maintenance concept (AVIM, AVUM, and GS) and OH-58A maintenance allocation charts as a baseline, a logistic support analysis will determine where modifications are needed.

Capitalizing on **Built-In Test Equipment (BITE)** and **Test, Measurement, and Diagnostic Equipment (TMDE),** our AVUM and AVIM maintenance time should be reduced.

Two offices in the Army community are dedicated to ensuring the AHIP meets the production schedule and fulfills the scout requirements: the **TRADOC System Manager (TSM)** articulates the user requirements to the AVRADCOM **Project Manager (PM)** and is the user's direct representative in the program development.

The AHIP PM office is the Army's interface with the civilian contractor. Together, they are responsible to assure that the user gets what he needs, and that it is fully supported when fielded.

Filling a void

The **Army Helicopter Improvement Program** fills the void that has long existed in the Army's scout capability. It incorporates modern technology into an already existing airframe and reduces crew workload — while significantly increasing effectiveness. It will be provided at less cost, and will be fielded years before a new development scout helicopter could be fielded.

The AHIP will enhance the combined arms team capability to see farther, shoot straighter, and rapidly generate the combat power necessary to decisively influence the outcome of the battle.

by GEN Donald R. Keith

AHIP and the new acquisition process

ON May 4, 1981, the Office of the Secretary of Defense issued the **Carlucci Report** defining the current administration's objectives and methodology for improving the defense acquisition process. The objectives were not new — reduce costs and field supportable, reliable equipment in a shorter time.

The methodology, on the other hand, provides for significant revision. Reduce the major reviews; put more authority in the hands of the services; recognize the benefits of economic procurement rates; and acknowledge Government responsibilities in assuming financial risks to procure in a manner which permits accelerated fielding of equipment.

The services were also challenged to better define requirements and equipment solutions, and to exercise more positive controls.

The Army Helicopter Improvement Program is one of the first major Army programs initiated since the **Carlucci Report.** The program has many significant new features, most notable of which is the use of a fixed price type of contract in an **Army Aviation Development Program.**

But the fixed price contract extends beyond the agreement between the developer and the contractor. The delegation of additional authorities to the services carries with it the responsibilities to insure that programs are successfully conducted within the budgeted cost estimates — in effect fixed price programs.

This approach necessitates a new era of baseline configuration control. We must insure that we retain the baseline definitions and configurations that we described to OSD. Under the fixed price contract, requirements or configuration changes are neither solicited nor encouraged. Both the developer and the user must recognize this new way of doing business.

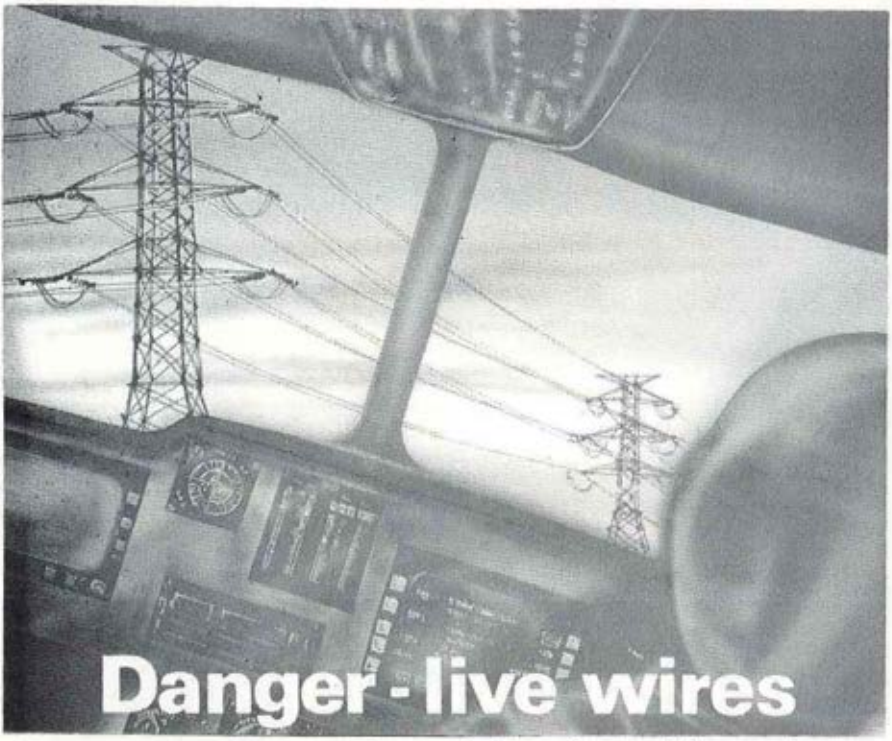
The Army will continue to develop and provide to the user the most up-to-date and effective equipment that our talents permit. Life extension changes which thorough analyses show to be beneficial and cost effective will be incorporated through block improvement programs.

This program provides us the opportunity to implement the **Carlucci Initiatives** and assume our new project responsibilities. I have personally asked Colonel Rundgren, the Project Manager to exercise his authority in controlling program changes.

I also need and expect to get the support of all other organizations involved in the development of this helicopter system to retain a solid baseline. In this way we can develop, field, and support this helicopter as rapidly as possible and within the budget provided to us by Congress and the Office of the Secretary of Defense.

ABOUT THE AUTHOR

LONG FAMILIAR WITH ALL OF TODAY'S HARDWARE PROGRAMS WITHIN ARMY AVIATION, GENERAL DONALD R. KEITH IS THE COMMANDING GENERAL OF THE US ARMY MATERIAL DEVELOPMENT AND READINESS COMMAND.



Power cable strike hazards, the biggest single threat to army helicopter operations, are reduced to safe proportions by a simple cockpit-mounted display.

There is no need to risk trained crews or aircraft when a Sperry cable warning system will help you steer clear of trouble.

Ask us about cable warning systems, we understand how important it is to listen.

SPERRY, SUITE 401
1725 SOUTH JEFFERSON DAVIS HIGHWAY,
ARLINGTON, VIRGINIA. 22202.
Telephone Area Code 703 892-0100

SPERRY GYROSCOPE, BRACKNELL, BERKSHIRE, ENGLAND RG12 1QL
Telephone: Bracknell 3222. Telex: 848129

SPERRY

SPERRY GYROSCOPE IS A DIVISION OF SPERRY LIMITED

by BG Bobby J. Maddox

The aeroscout in the Airland Battle

THE improved aeroscout being developed through the **Army Helicopter Improvement Program (AHIP)** will significantly enhance the vital role that Army Aviation has on the Airland battlefield. This aircraft will provide the day and night standoff target acquisition and designation capabilities so essential to achieving optimal employment of AH-64/**HELLFIRE** and **COPPERHEAD** while also providing accurate and timely battle information to commanders.

As one of the major systems absolutely needed to meet Division and Corps 86 aviation requirements, it will make important contributions toward achieving rapid and decisive concentrations of combat power.

Unlike most other major systems coming into the Force, AHIP blends existing and new technology. It represents the combat and materiel developers' response to critical user needs with an affordable solution.

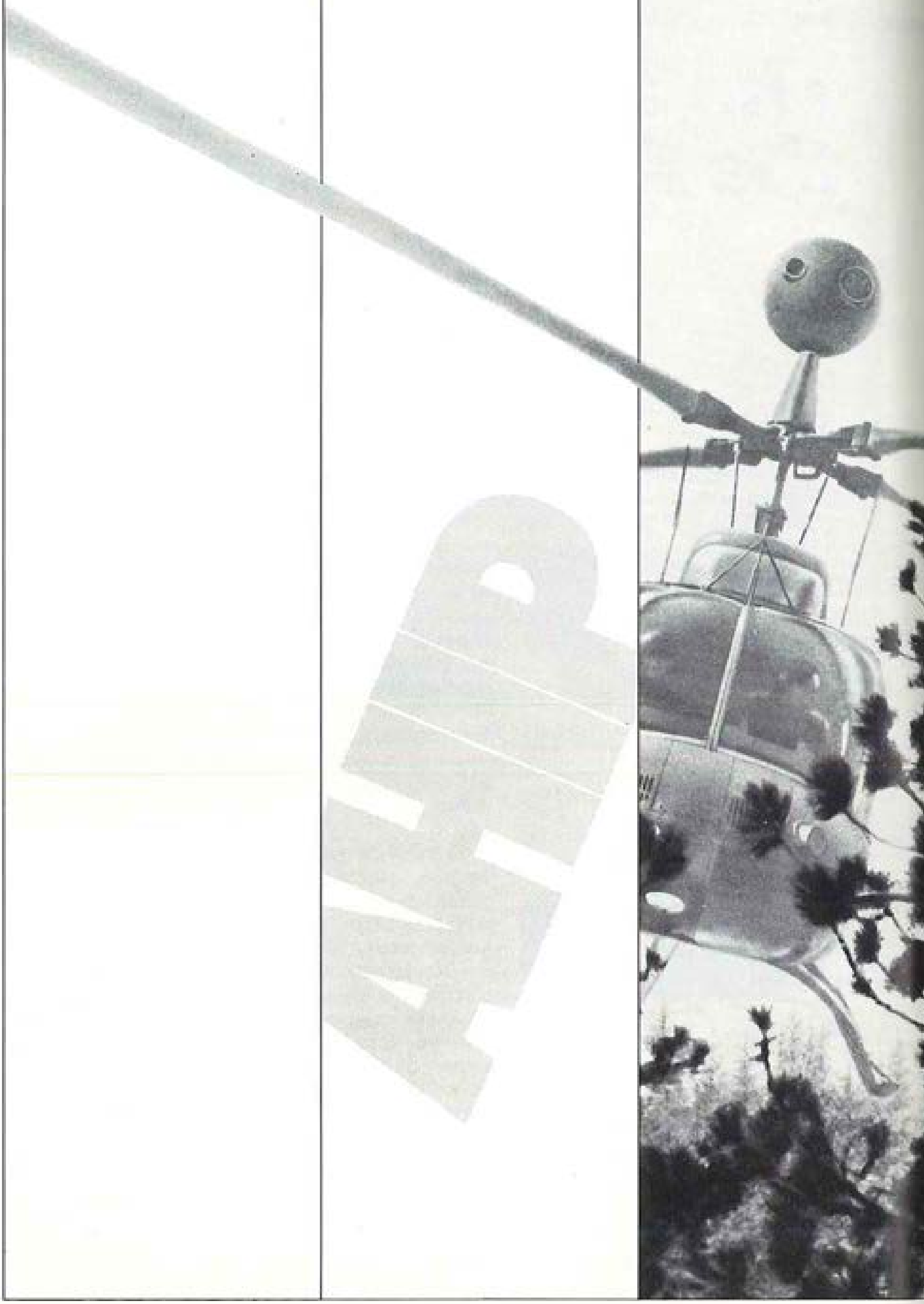
The developmental effort is in its early stages and there is much hard work yet to be done.

To assure that the users' needs are fully met and the AHIP is supportable upon fielding, we must do a thorough and professional job across the board, especially in the area of **integrated logistic support (ILS).**

TRADOC is confident that those involved with the AHIP developmental effort will ably meet the many challenges ahead.

We in TRADOC are committed to the requirement, its procurement, and its entry into the Force quickly. ■

A COMBAT VETERAN AND MASTER ARMY AVIATOR, BRIG. GEN. BOBBY J. MADDOX IS THE ASSISTANT DEPUTY CHIEF OF STAFF FOR COMBAT DEVELOPMENTS FOR OPERATIONS AT HQ, USA TRADOC.


AHIP

Making

Advanced

Technology

Work

NORTHROP

Army Helicopter Improvement Program. With a new uniquely stabilized Mast Mounted Sight provided by McDonnell Douglas and passive sensor systems from Northrop. So helicopter crews can see enemy targets at safe standoff ranges.

FLIR. TV. Laser range finder/designator. Digital tracker. Automatic boresight. Proven sensors with demonstrated reliability. Day or night. Through battlefield smoke. In adverse weather.

Passive sensor systems from Northrop. Simple. Effective. Reliable.

Northrop Corporation,
Electro-Mechanical Division,
500 East Orangethrope Avenue,
Anaheim, California 92801.

by MG Carl H. McNair, Jr.

AHIP - Truly a team effort!

THE AHIP near term aeroscout promised to significantly improve the capabilities of attack helicopter, air cavalry, and field artillery units. Although the U.S. Army Aviation Center has played a major role in developing and validating requirements for the US **Army Helicopter Improvement Program,** the combat development process has truly been a team effort involving the U.S. Army Armor Center and the U.S. Army Field Artillery Center mission proponents, as well as numerous other TRADOC centers and agencies.

This team approach has insured that the needs of all users have been fairly represented.

The challenges that lie ahead on the road to fielding the AHIP are many. To meet these challenges, the U.S. Aviation Center will continue in its role as trainer, integrator, coordidinator, and planner.

Focal points for these efforts will be the TSM for Scout Helicopters and the Directorates for Combat Developments, Training Developments, and Training and Doctrine.

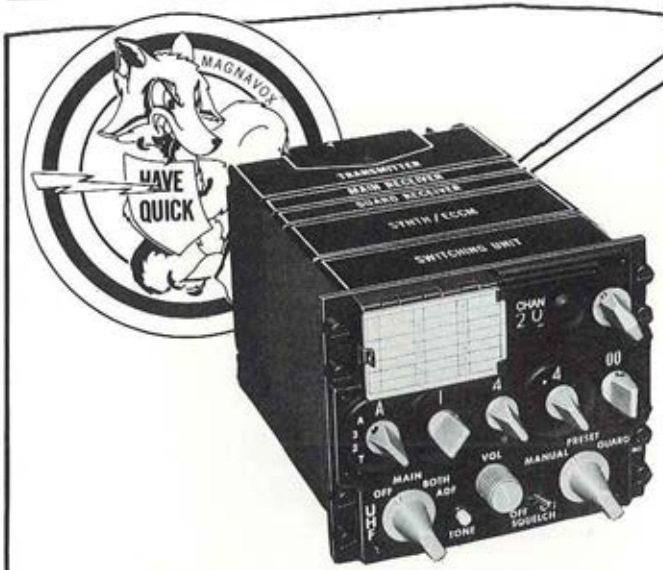
The development and execution of sound training programs for AHIP crewmembers will be especially critical to the system's success on the battlefield and will receive our full commitment.

At the same time, we will work closely with the materiel developer to assure that the AHIP aeroscout reflects the benefits of innovative and intensive **Integrated Logistic Support (ILS)** management when AHIP is fielded. The needs of the user will be foremost in our minds.

ABOUT THE AUTHOR

ALWAYS SUPPORTING THE "TEAM" CONCEPT WITHIN ARMY AVIATION AND THE AAAA, MAJOR GENERAL CARL H. MCNAIR, JR., COMMANDS THE U.S. ARMY AVIATION CENTER AND FORT RUCKER.

Tactical Communications Assured — AHIP Brings the 'FIRST TEAM' into ACTION



The AN/ARC-164, a radio with outstanding performance and reliability, has been made even better by the addition of an anti-jam capability using the Magnavox-designed HAVE QUICK System developed for U. S. Air Force Systems Command. HAVE QUICK is the only fully operational anti-jam communication system in use by the U. S. Air Force and requires no modification to the airframe.

In volume production since 1976 the AN/ARC-164 has demonstrated an excellent field MTBF rating.

What is HAVE QUICK? This System consists of an ECCM modification to Airborne and Ground Radios to give them a frequency hopping capability. This is a technique wherein the frequency being used for communication is changed rapidly many times per second.

Magnavox
Electronic Systems Company
A DIVISION OF *MAGNAVOX GOVERNMENT AND INDUSTRIAL ELECTRONICS COMPANY*

1313 PRODUCTION ROAD • FORT WAYNE, INDIANA 46808 • Cable: MAGNAVOX Telex 22-8472 • TWX 810-332-1610 (219)429-6000

by MG Story C. Stevens

Interfacing with the user

THE execution of the **Army Helicopter Improvement Program** contract on 21 September 1981 signifies the culmination of a long process of definition and justification by the Army to develop an improved scout helicopter.

Since the early 1970's, and particularly in the past two years, the user and developer communities have been working hard to define an achievable and affordable scout helicopter system which would meet the Army's needs in the aviation combat environment.

Communications verify needs

We in the Aviation Resource and Development community are continuing our efforts to improve the communication process between ourselves, the user, and industry to insure that program initiation and execution are closely attuned to the needs and priorities of the user.

AVRADCOM and TRADOC recently presented a highly successful **Advanced Planning Briefing for Industry (APBI)** to explain these needs and priorities.

Our work with the Army Aviation mission area analysis will further provide opportunities to improve Army Aviation in the future.

In the February-March edition of **Army Aviation Magazine,** the Aviation Research and Development Command will describe its mission and its methodology for accomplishing that mission.

Congratulations are in order

At this time, I would like to personally congratulate the Advanced Scout Helicopcopter Project Manager, the TRADOC System Manager for Scout Helicopters, Bell Helicopter Textron, and the user and developer communities at large for their success in articulating the mission requirement and in defining the system that will permit the Army to meet that requirement through the **Army Helicopter Improvement Program.**

Most of all, my congratulations go to the scout helicopter pilots and observers who will be the beneficiaries of the significant improvements embodied in the **Army Helicopter Improvement Program.**

GENERAL STEVENS - AS COMMANDER OF THE ARMY'S AVIATION RESERACH AND DEVELOPMENT COMMAND AND AS A FELLOW AVIATOR - APPRECIATES THE SIGNIFICANCE OF THE AHIP TO AEROSCOUT PILOTS AND OBSERVERS.

Cost-effective IR suppression.

Bell's AH-1S Cobra gives Army pilots the last word in battlefield flexibility and firepower versatility.

And now, Garrett's new cost-effective Infrared Suppressor System gives them the last word in survivability against threats from IR heat-seeking missiles.

Developed with the U.S. Army's Aircraft Survivability Group, our IR Suppressor System's light-weight, self-cooled design reduces the temperature of both the exhaust system metal and plume to the point where they're virtually invisible to the infrared eye of an oncoming enemy missile.

Now in production, Garrett's IR Suppressor System works equally well in both flight and hover modes, without requiring a fan. A fact that makes it an ideal candidate for retrofitting to other turbine-powered helicopters.

For complete information, write: Sales Manager, Heat Transfer Systems, AiResearch Manufacturing Company of California, 2525 West 190th St., Torrance, CA. 90509. Or phone: (213) 323-9500.

GARRETT The Garrett Corporation
One of The Signal Companies

Garrett's AiResearch Heat Transfer Systems

by COL Ivar W. Rundgren, Jr.

The long march

SINCE our last ASH issue of "**Army** Aviation" in October 1979, Army Aviation has achieved a long sought development objective. The new development ASH could not compete financially — the Army's procurement plate runneth over.

However, the near term scout alternative which the ASARC directed that we pursue, can compete in the acquisition process and, ultimately, in combat. Although Bell Helicopter Textron won the competition to modify an existing inventory helicopter to the AHIP role, the real winner will prove to be the Army's scout pilot. Once the scout team reads through this issue, I feel certain the team members will agree with that observation.

Not without trials

This accomplishment, an improved scout helicopter development program, was not without its trials and tribulations. Approximately 10 years have passed since the first recognizable improved scout helicopter program was formulated. That program was the **New Initiatives Aerial Scout (NIAS)** — essentially an upgrading of the current LOH's (OH-58A and OH-6A) concentrating on performance, night vision, and target acquisition.

The NIAS goal was aimed at performance — improving the LOH's for joint operations with attack helicopters. For one reason or another the Congress denied the funding and so started the "On again, off again " scenario of the scout helicopter development.

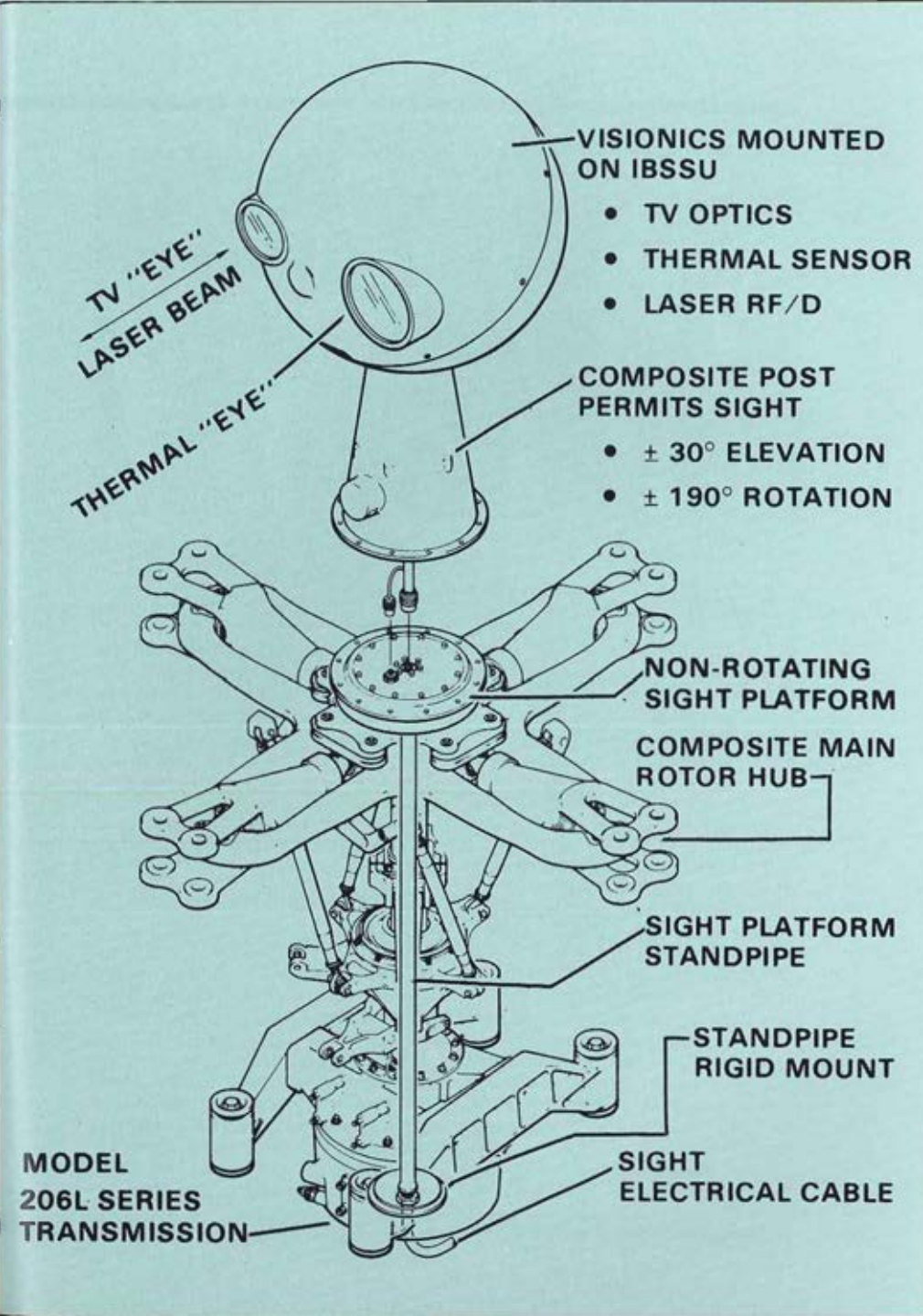
The numerous iterations of attempted/contemplated scout helicopter development programs, i.e., NIAS, ASH, ISH, IATADS, ASH, and finally AHIP, are certainly no testimonial to our acquisition process. Howsoever, even bad examples become good examples. The process from NIAS to ASH to AHIP did prove worthwhile in some aspects.

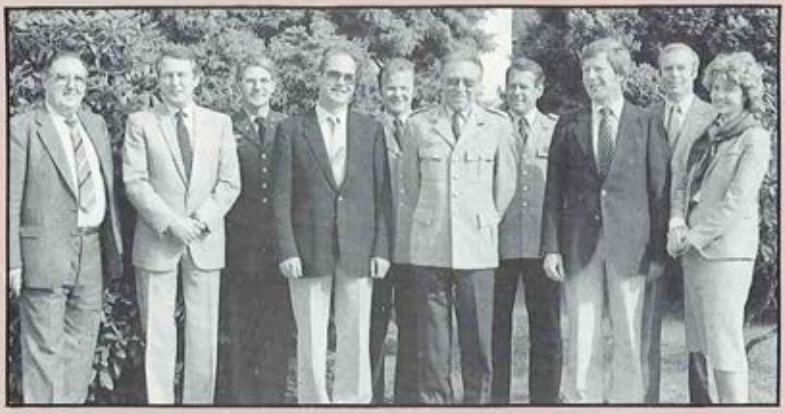
More bang for the buck

We do have, or will have, 585 improved OH-58C's; the AHIP target acquisition device will be mast mounted which means enhanced survivability; and we are upgrading existing inventory assets, giving the taxpayer more bang for his buck.

Reflecting back to August 1978 when **COL George Shallcross, Ret.,** the former TSM—ASH, and I began the latest ASH development process and, of course, the House and Senate Armed Service Committees were also instrumen-

AS AHIP PROJECT MANAGER, COLONEL IVAR W. "WALT" RUNDGREN HAD THE PROVERBIAL "PATIENCE" AND HAS WATCHED ALL OF THE PROGRAM'S COUNTLESS UP, DOWN, AND UP GYRATIONS OVER THE PAST 10 YEARS.


VISIONICS MOUNTED ON IBSSU
• TV OPTICS
• THERMAL SENSOR
• LASER RF/D
TV "EYE"
LASER BEAM
THERMAL "EYE"
COMPOSITE POST PERMITS SIGHT
• ± 30° ELEVATION
• ± 190° ROTATION
NON-ROTATING SIGHT PLATFORM
COMPOSITE MAIN ROTOR HUB
SIGHT PLATFORM STANDPIPE
STANDPIPE RIGID MOUNT
SIGHT ELECTRICAL CABLE
MODEL 206L SERIES TRANSMISSION



BUECKEBURG GATHERING—Shown during the Bonn Chapter—AAAA late September meeting at the home of the German Army Aviation School are a select group of Chapter members. From L-R are John Courchas (Sikorsky), Joachim Zieger (Bodenseewerk), LTC Helmut Roeder (Pres, Bonn Chapter), Eckhard Kuehnle (Dornier), LTC Uwe Hain (Div. III), COL Kurt Veeser (Commandant, German Army Aviation School), LTC Wigand Tielmann (Div. II), Wolfgang Schubert (Dornier), LTC Helmet Steuernagel (Celle), and Mrs. Steuernagel.

tal in this process, one factor looms largest. There were few, if any, supporters of the ASH program — with the exception of the real scout pilot.

One gentleman thought it had a 40/60 change of bringing it through — guess who had the 40! He is now one of our strongest proponents. That transformation is typical of many of the program's initial doubters.

Once the word spread that this AHIP would be a modification program and cost well below a new development — with aggressive cost control, the support started building.

The Congress has been a strong supporter of the program, but not for a new development, however. Without the $20.9 million plus-up in fiscal year 1981 we would still be a long way from the starting gate. Provided we maintain our current tack, and keep them informed, I believe the Congress will be our staunchest supporter.

When **Deputy Secretary of Defense Carlucci** forwarded his acquisition initiatives to the services last May, I knew the program was in the home stretch. The flexibility and decentralization provided the services (and the PM) by that document is heartening.

The Program Go Ahead Review (in lieu of DSARC II) is scheduled for March 1982. Once that milestone is achieved, and I'm confident it will be since there are no major program issues, the program will really be off and running.

Be pleased and proud!

The Army, and those in Army Aviation in particular, can be pleased and proud of what's been accomplished in AHIP. That accomplishment was derived from a dedicated team effort. The team started with E-4 mechanics (67N) and goes all the way to the Secretary of the Army — almost everyone had a piece of the action.

For the Army — after numerous valiant attempts — we've succeeded in starting a logical and defensible scout helicopter development program. For the Army scout pilots — **a better mousetrap.**

Litton's ubiquitous AHRS onboard AHIP

To win AHIP, Bell Helicopters Textron submitted their most inventive technical ideas and their toughest scout aircraft. But before all else they needed a durable, low-cost navigator capable of performing in the NOE mission.

An AHRS That Navigates

Litton's superior, cost-effective LR-80 strapdown inertial attitude and heading reference system was selected because it could provide *more* than simple heading and attitude information. Using doppler data the LR-80 navigates with an accuracy four times better than current operational aircraft. This is without benefit of update. With updates, performance is even better.

It Does More

In addition to accurate body rates, heading and attitude, the AHIP LR-80 provides continuous position determination, latitude and longitude converted to UTM coordinates, distance and bearing to waypoint and/or home, target coordinates and velocities, and azimuth and distance to target for prepointing mast-mounted sight and laser. And by being MIL-STD 1553 compatible, the LR-80 is already prepared for future improvement programs.

Superior Becoming Standard

With Litton's LR-80 onboard AHIP, the Army will soon enjoy the standard benefits of commonality, for the LR-80 is also onboard the Army's newest attack helicopter. The hunter-killer mission uses both scout and attack aircraft in concert. We are pleased that our LR-80 AHRS is onboard both.

Ubiquitous AHRS?

Yes. Litton's LR-80 AHRS is not only onboard both aircraft involved in the hunter-killer mission, the LR-80 was selected, individually, by *all* AHIP contenders. That's an achievement to be proud of.

Litton

GUIDANCE & CONTROL SYSTEMS

5500 Canoga Avenue, Woodland Hills, California 91367

by COL Robert S. Fairweather, Jr.

Representing the user

TRADOC has long identified the need for an improved aeroscout based on the serious threat that we face, the new systems that we are fielding, the new organizations and doctrine that we are developing, and the inadequacies of existing scout helicopters.

At the same time, TRADOC has been well aware of the constraints of affordability and developmental lead time. These considerations led to the documentation of the need for an improved aeroscout that could meet basic mission requirements while being affordable and ready for fielding in the near term. Thus was born the **Army Helicopter Improvement Program (AHIP).**

The basic concept of the AHIP aeroscout recognizes the requirement to operate in a region of tactical uncertainty and high risk. Standoff target acquisition, agility, and maneuverability are essential if the ship is to survive and accomplish its mission.

The aeroscout must provide high performance and agility throughout the world. The mast mounted sight is required to allow the aeroscout to remain concealed while viewing the battle area with mast mounted day and night sensors that can acquire targets at standoff ranges and laser designate them for precision guided munitions fired from attack helicopters, artillery, and Air Force aircraft.

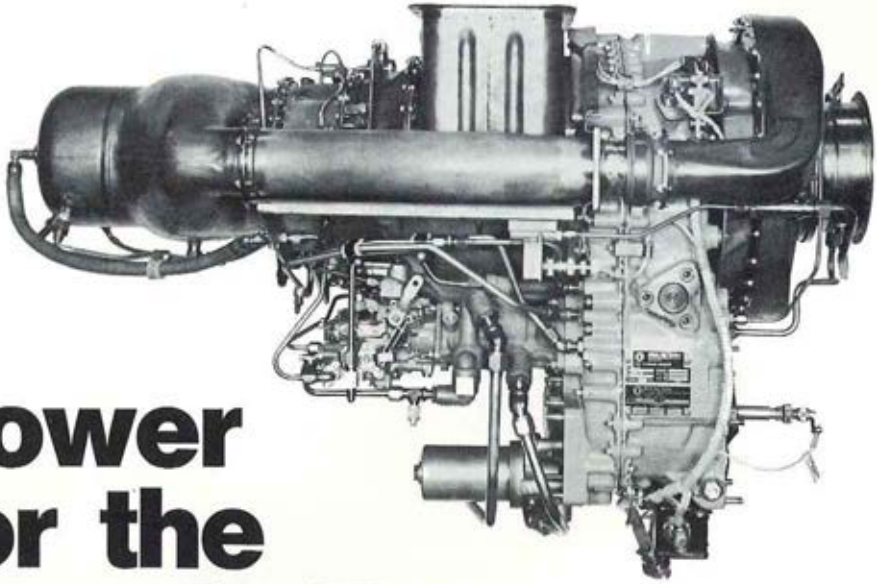
THE TRADOC SYSTEM MANAGER (TSM) FOR SCOUT HELICOPTERS, COLONEL ROBERT S. FAIRWEATHER RELATES THE EMPLOYMENT OF AHIP AS AN ATTACK TEAM AEROSCOUT, AIR CAV AEROSCOUT, AND FAAO AEROSCOUT.

A major contributor

The AHIP aeroscout will contribute significantly to the airland battle. It has the mobility to rapidly examine the battlefield and inform the commander of what is happening. It can focus on the information collected by other intelligence means and refine it through first hand observation.

The aeroscout can precisely locate targets at standoff distances during both day and night conditions. At the same time, it can provide the human evaluation necessary for accurate target value analysis. One of its most powerful roles is to integrate and employ multiple forms of firepower, to include attack helicopter fires, artillery and close air support.

It will be an excellent platform for tactical command and control, especially for aviation operations. Further, security can be provided through surveillance, reconnaissance, and overwatch, and, when equipped with the air-to-air **Stinger,** the AHIP will be able to protect itself, other



Power for the Army's Future

The AHIP Scout Helicopter will be powered by the advanced Allison 250-C30R engine that incorporates the combat proven technology and reliability of the over 4,000 T63 engines delivered to the Army.

The C30R has a firm military and commercial background of over 20 million flight hours. With the stringent requirements of the AHIP mission, the C30R is flat rated offering hot and high performance never before experienced in any other Scout Helicopter in the Army inventory.

The advanced technology supervisory electronic fuel system gives the pilot better engine control allowing him to keep his eyes on the terrain. This is one of the most important requirements of the AHIP mission.

Detroit Diesel Allison is proud to be part of the AHIP program.

Allison Gas Turbines

Detroit Diesel Allison

GM

FIGURE 1 — AHIP AEROSCOUT CONCEPT

helicopters and ground elements from the **HIND.**

Lastly, the AHIP provides a means to rapidly evaluate terrain over a wide area, not only for tacticians, but also for engineers and logisticians.

The AHIP will go into the same organizations now using the OH-58 as a scout helicopter and will replace it on a "one for one" basis. When the Army moves to the Division 86 force structure, aviation units will be smaller in size but there will be more of them, thus resulting in approximately the same total requirement for aeroscouts.

Aeroscouts perform specific mission essential functions vital to the success of the ground combat mission. The table below shows these mission essential functions and the equipment required in the AHIP aeroscout to perform the functions.

TABLE 1—AHIP MISSION ESSENTIAL FUNCTIONS AND EQUIPMENT

MISSION ESSENTIAL FUNCTION	EQUIPMENT
Gather target information	Mast Mounted Sight (MMS)
Coordinate, lead mission	FM, VHF, UHF, HF/SSB radios
Designate targets	Laser Designator in MMS
Adjust fires (Arty/CAS)	FM radios, laser designator in MMS, automatic target handoff
Conduct security and reconnaissance	Improved handling capabilities MMS, armament
Select battle positions	MMS, radios, improved handling
Assist atk hel movement	Radio, visual nav display
Provide local security	MMS, radios, Air-to-Air STINGER
Coordinate with ground commander	FM radios, visual nav display

The AHIP aeroscout will be employed in three primary operational mission roles: the attack team aeroscout, the air cavalry aeroscout, and the field artillery aerial observer aeroscout.

Attack Team Aeroscout

Attack helicopter teams are employed to destroy enemy armored and mechanized forces as an integrated member of the combined arms team. They are offensive in nature. They fight from battle positions in concert with other combined arms team members in accordance with the commander's scheme of maneuver.

The AHIP will cause no change in the doctrinal attack team mix of three scout and five attack helicopters. Typically, the team displaces forward from an assembly area, and is placed in a holding area while the team leader coordinates with the ground commander. Routes and battle positions are selected by the team leader based on his observation of the enemy and friendly situations, and the team occupies those positions using **nap-of-the-earth (NOE)** flight tactics.

The team leader orchestrates the flow of the battle by assigning targets, sectors, or kill zones. He maintains contact with the ground commander and coordinates close air support and artillery fire support for the team. He also provides overwatch for the teams, and when equipped with the air-to-air **STINGER,** provides early warning and defensive fires against enemy helicopters.

The scouts in the attack elements provide target detection and acquisition for their attack helicopters. They do this by viewing the battle area through their mast mounted sights, identifying targets, transferring target information to the attack helicopters, and laser designating when **HELLFIRE** or **COPPERHEAD** munitions are employed.

Regardless of how the teams are tactically employed or which type of attack helicopters are in them (AH-1S or AH-64),

the improved aeroscouts will greatly enhance overall effectiveness and survivability.

Figure 2 shows an attack team employed in the battle area.

Air Cavalry Aeroscout

Air cavalry units perform reconnaissance, security, and economy-of-force operations using the general concepts established for ground cavalry, but with some important differences. Air cavalry units provide a significantly increased capability to rapidly reconnoiter and maintain surveillance over wide areas of the battlefield.

They may operate independently, may work in conjunction with ground cavalry, or may be a part of combined arms teams. The most frequent missions given to air cavalry units are reconnaissance and screening. Screening is particularly well suited to the air cavalry since it allows the ground commander to redistribute his ground forces and use air cavalry in an economy-of-force role.

The key to air cavalry operations is mobility. The mobility advantages provided by helicopters allow the air cavalry to rapidly expand the area of battle, particularly in early stages, thus reducing enemy reaction time and insuring more time for reaction of the friendly main body.

Air cavalry operations focus on the aeroscout, which provides the capabilities for reconnaissance, surveillance, target acquisition, collection of battlefield information and intelligence, and management of organic and supporting firepower.

Depending on the **mission, enemy, terrain, and troops (METT)** available, air cavalry troop assets are task organized into teams built around the aeroscout. These teams may range from those composed entirely of aeroscouts, to those organized with a three scout, five attack helicopter mix.

For example, a team of two aeroscouts may suffice to conduct a route reconnaissance where enemy contact is unlikely. To conduct surveillance of an enemy avenue of approach, a three scout, two attack helicopter mix may be appropriate. As contact becomes more likely, then more attack helicopters may be added.

However, the aeroscout does not depend entirely on the relatively austere organic attack helicopter assets available to him. More often than not, he will have at his disposal firepower from attack helicopter units, artillery, or close air support.

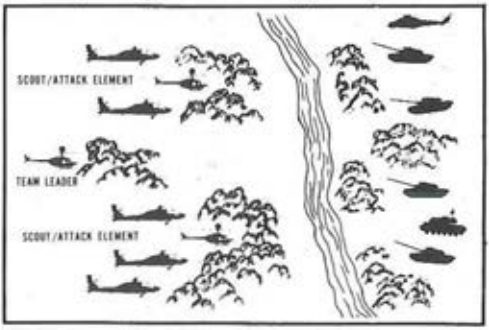


FIGURE 2 — BASIC ATTACK HELICOPTER TEAM

The day and night sensors in the AHIP mast mounted sight will allow the aeroscout to collect battlefield information and intelligence, and acquire targets at stand-off distances. With his laser designator, he can guide **HELLFIRE** and **COPPERHEAD** against targets.

His small size, his ability to use the mast mounted sight while hiding behind cover and concealment, and his continuous employment of NOE tactics will make his detection difficult. The IR suppressors and radar warning receivers will provide further protection, and will enhance airframe agility.

The NOE radios will be especially valuable to the air cavalry aeroscouts because they greatly improve the capability to pass battlefield information and targets to supported elements. With the

navigational doppler, the aeroscout will be able to accurately locate himself and whatever he observes.

The team leader, located in one of the scout helicopters, is charged with the operational employment of his team. He provides command and control, coordinates with ground and aviation commanders, integrates fire support, and overwatches the team to provide security from ground or aerial threats When equipped with air-to-air **Stinger,** he will be able to attack enemy helicopters that pose a threat to the team.

Most importantly, the team leader determines the specific tactical techniques to be employed during team operations, and assures they are properly executed. **Figure 3** shows an air cavalry team in action.

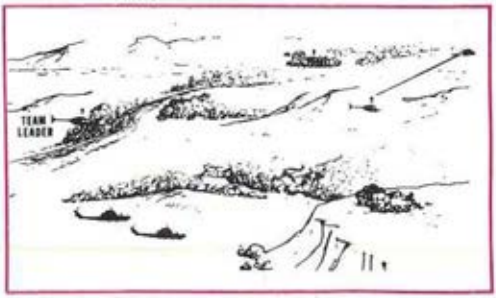


FIGURE 3 — AIR CAV TEAM EMPLOYMENT

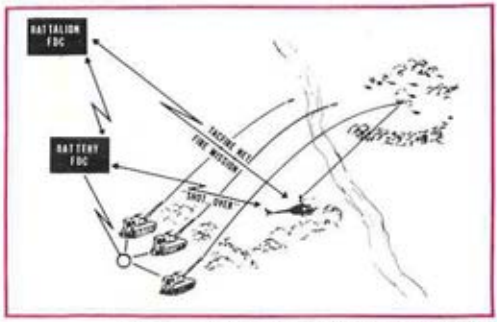


FIG. 4 — FA AERIAL OBSERVER EMPLOYMENT

Field Artillery Aerial Observer

Each division has dedicated artillery scout helicopters to provide artillery observers with the capability to rapidly move to critical areas for employment of field artillery fire support in accordance with the commander's scheme of maneuver. The AHIP aeroscout will serve as an excellent **Field Artillery Aerial Observer (FAAO)** platform from which to adjust conventional, improved, and precision guided munitions.

Using the AHIP's mast mounted sensors, the FAAO acquires targets at standoff distances. He employs NOE techniques similar to those used by aeroscouts in attack helicopter units. Fire missions are passed through the TACFIRE net via the automatic target handoff system onboard the AHIP. The FAAO adjusts conventional artillery essentially the same way as a ground observer does.

COPPERHEAD engagements require that the FAAO laser designate the targets for the **COPPERHEAD** projectiles. The FAAO does this by placing the laser spot on a target within the **COPPERHEAD** seeker's footprint.

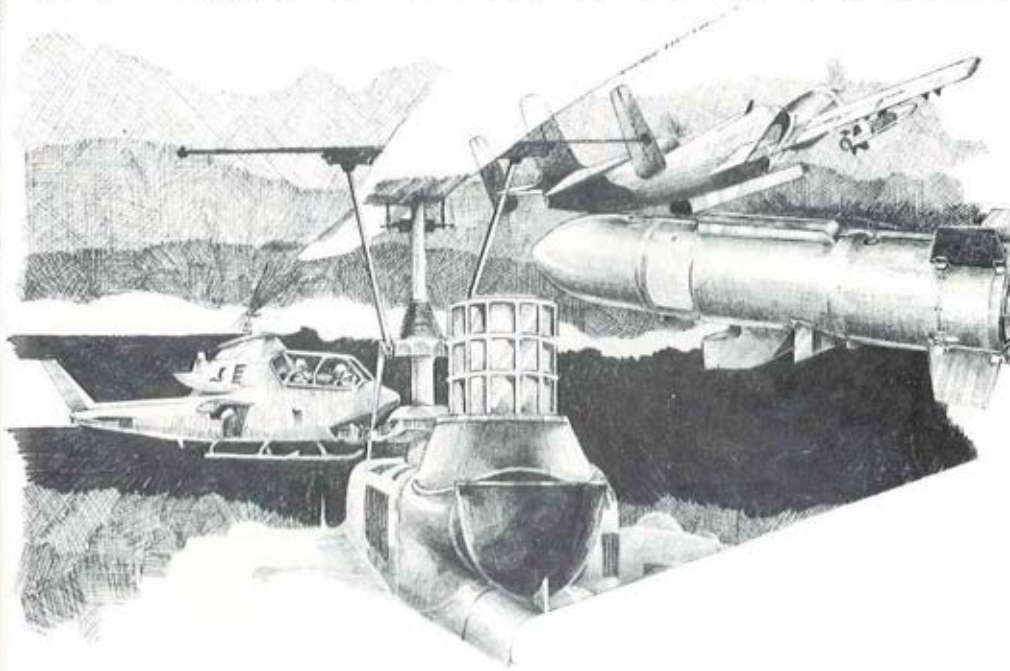
After the first **COPPERHEAD** strikes the initial target, the FAAO shifts the laser spot to other targets, guiding successive rounds to specific target locations within the target area. **Figure 4** portrays the FAAO in the conduct of an artillery engagement.

The mission capability afforded by the AHIP provides the FAAO the opportunity to conduct other fire support missions on the battlefield. They include coordinating close air support, gathering intelligence, and conducting target damage assessment.

Other AHIP Roles

No description of the AHIP aeroscout would be complete without the description of other missions that the AHIP is well suited to perform. In addition to the three

FLIGHT INSURANCE...



Sanders' Infrared Countermeasures Systems

Sanders' Infrared Countermeasures (IRCM) offer flight insurance that can't be bought over the counter. These systems increase aircraft survivability in a hostile environment, thereby increasing mission effectiveness. Systems such as the AN/ALQ-147 for fixed wing aircraft like the OV-1D and AN/ALQ-144 for helicopters such as the AH-1S feature proven performance, high reliability and simple maintenance. Both have been fully flight qualified.

For further information, call or write:

SA® SANDERS ASSOCIATES, INC.

Sanders Associates, Inc.
Defensive Systems Division
95 Canal Street
Nashua, NH 03061
ATTN: MER 12-1308
(603)885-3583

Shrink your comm package down to size. The Collins AN/ARC-182 4-in-1 Combo.

One transceiver that can talk to all services. That's the idea behind the versatile Collins AN/ARC-182. It's 4 transceivers in 1, covering 4 bands in the 30-399.975 MHz range, including AM and FM modes.

AN/ARC-182 can shrink logistic support requirements, too. Less training and fewer manuals. Less test equipment. Fewer spare parts.

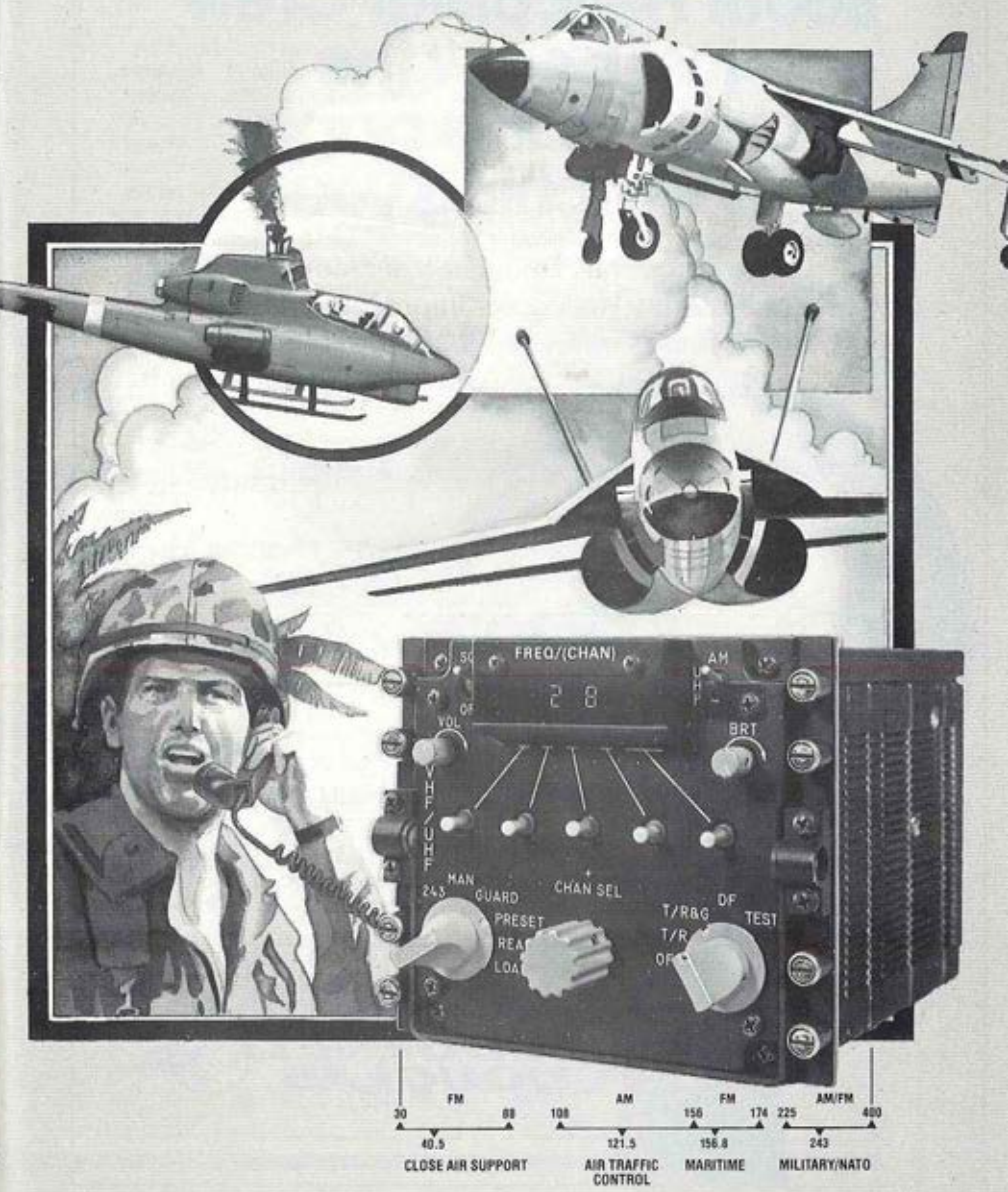
In action for the U.S. Navy and numerous other nations, the 4-in-1 Combo is ideal for joint operations. It has tough-to-beat credentials, and it is rugged enough to perform reliably for Army fixed wing and helicopter applications.

Other features? Built-in guard receivers for each of the 4 bands. Built-in test. Reception for ADF in VHF-AM and UHF-AM. Homing in VHF-FM. 25-kHz channel spacing. Panel or remote mounting. Weight? A mere ten lbs. And it's a cost-effective, highly maintainable unit. Ideal for retrofit, too.

The Collins 4-in-1 Combo. A great way to shrink your communications package down to size. For details, contact Collins Telecommunications Products Division, Rockwell International, Cedar Rapids, Iowa 52498 U.S.A. Phone 319/395-2205.

Rockwell International

...where science gets down to business


FREQ/(CHAN)
AM
28
VOL
OFF
BRT
VHF/UHF
MAN
GUARD
CHAN SEL
PRESET
T/R&G
T/R
OFF
TEST
FM
AM
FM
AM/FM
30
88
108
156
174
225
400
40.5
121.5
156.8
243
CLOSE AIR SUPPORT
AIR TRAFFIC CONTROL
MARITIME
MILITARY/NATO

An Army Scout Helicopter Crew just below the edge of this page is watching you.

The McDonnell Douglas Mast Mounted Sight, part of the Army Helicopter Improvement Program, provides new eyes for survivable day/night battlefield management.

- **Surveillance.**
- **Long Range Target Acquisition.**
- **Precise Laser Designation.**
- **Automatic Target Handoff.**

Mast Mounted Sight

MCDONNELL DOUGLAS

primary roles, the AHIP has the mission equipment suitable for employment in the following secondary mission roles.

Alternate Command Post for Maneuver Commanders: The communications and visionics capabilities can provide air and ground commanders with the ability to access the battle situation, to quickly move around the battlefield, and to exercise command and control over tactical units.

Communications Relay: The capability to communicate over extended ranges with its HF/SSB and secure, improved FM radios, VHF and UHF communications makes the AHIP a potential communications relay station for both ground and aerial forces.

Nuclear, Biological and Chemical Surveys: Navigational capabilities of the AHIP allow for precise routes to be programmed and flown, enabling commanders to accurately survey areas suspected of contamination, within the limits of the crews' protective equipment. Contamination sensors are not a part of the AHIP mission equipment and will have to be provided. **(Continued on Page 85).**

OFFICE OF THE TRADOC SYSTEM MANAGER —SCOUT HELICOPTER (TSM-SH)

FORT RUCKER, ALABAMA 36362

COLONEL
ROBERT S.
FAIRWEATHER
TRADOC SYSTEM
MANAGER-SCOUT
HELICOPTERS

LT. COLONEL
REGINALD A.
NEUWIEN, JR.
DEPUTY TSM FOR
AHIP
COORDINATION

MAJOR
ARTHUR L.
POPE
ASST TSM—
DOCTRINE, TACTICS
AND TESTING

MAJOR
E. GRANT
FOSSUM, II
ASST TSM—
TNG & PERSONNEL

MAJOR
THOMAS A.
KONKLE
ASST TSM—
LOGISTICS

Advanced Scout Helicopter Project Manager's Office (ASH PMO)

LTC
LEO J. ASSELIN
ASST PROJECT
MANAGER
FOR
PROGRAMS

MAJOR
JAMES CHRISTIE
ASST PROJECT
MANAGER
FOR
LOGISTICS

EARL T.
GATLIN
CHIEF, PROGRAM
MANAGEMENT AND
OPERATIONS
DIVISION

MRS. SUSAN S.
HALPERN
ADMINISTRATIVE
OFFICER

COLONEL
IVAR W.
RUNDGREN, JR.
PROJECT
MANAGER

Corresponding Address
USA AVRADCOM
ATTN: DRCPM-ASH
4300 Goodfellow Boulevard
St. Louis, MO 63120

JAMES F.
MATTHEWS
DEPUTY
PROJECT
MANAGER

LTC
DONALD A.
WILLIAMSON
R&D
COORDINATOR

JOHN A.
McLAUGHLIN
CHIEF,
TECHNICAL
MANAGEMENT
DIVISION

VICTOR W.
WELNER
CHIEF, PRODUCT
ASSURANCE
AND
TEST DIVISION

JOHN A.
BARTIN
CHIEF,
LOGISTICS
MANAGEMENT
DIVISION

TELEPHONES:
COMMERCIAL:
(314) 263-1360
AUTOVON:
693-1360

RONALD G.
MOORE
PROCUREMENT
AND
PRODUCTION
OFFICER

by John A. McLaughlin, Melvin W. Jackson, and Darrell L. Harrison

AHIP meets the requirements

SEE without being seen — anywhere — anytime!. That's the objective of the **Army Helicopter Improvement Program (AHIP).**

Through joint efforts of the U.S. Army user and developer communities, specific AHIP performance and mission equipment requirements were defined. Briefly, these requirements are:

To provide day and night target acquisition and designation;

To improve communication, navigation and target location capabilities; and

To provide performance and maneuverability margins in **nap-of-the-earth (NOE)** and hot environments and achieve an acceptable level of crew workload and survivability.

The requirements were articulated in a solicitation to industry in January 1981 and proposals were received in April 1981. An evaluation board, made up of the best available expertise from Army technical and user elements and industry consultants, very carefully compared proposed system capabilities with the requirements.

In preparation for the board, computer simulation models had been developed and correlated with available test data. These models were used to develop independent Government estimates of capabilities to substantiate proposed system performance.

On 21 September 1981, after appropriate decisions and reviews at senior Army and OSD levels, a contract was awarded to Bell Helicopter Textron, Ft. Worth, TX, for the development of the Bell Model 406 AHIP (**See p. 68 and 69**). The program includes modification of the US Army OH-58A to the AHIP configuration, qualification, and delivery of AHIP prototypes to the Army for development and operational tests starting in July 1984.

The real winner

The AHIP team, the developers and users, believe that the real winner of this competitive program is the U.S. Army scout crew. It is the crew who ultimately receive and employ a helicopter system that provides a true aeroscout for the modern battlefield. The AHIP will offer unparalleled scout performance, day and night, contributing to the more effective use of all the combined arms team in the Air Land battle.

How the AHIP meets the Army's re-

JOHN A. MCLAUGHLIN SERVES AS CHIEF OF THE ASH PMO TECHNICAL MANAGEMENT DIVISION; MELVIN W. JACKSON IS MISSION EQUIPMENT ENGINEER WHILE DARRELL L. HARRISON IS AIR VEHICLE ENGINEER.

quirements is described in three sections:

1.) The system performance and capabilities,

2.) The **mission equipment package (MEP)** and the critical man-machine interface, and

3.) The air vehicle and the changes which enable the AHIP to achieve its outstanding system performance.

The AHIP System

The system being used as a scout in the field today differs only in mode of transportation from the scout during the Civil War. Then the scout was mounted on a horse and used binoculars for "seeing" the enemy. Today, the scout rides in an OH-58C helicopter but still uses binoculars to find the enemy.

The AHIP (Bell Model 406) is designed to significantly enhance the scout's capabilities by taking maximum advantage of the inherent mobility and freedom of the helicopter while providing the most modern target acquisition/designation capability yet fielded on any scout helicopter.

In the area of aircraft performance, the Bell 406 AHIP excels not only in basic hover capability but also in the critical performance margins to safely operate in the NOE role. As illustrated in **Figure 1**, the AHIP will exceed the minimum Army requirement of a vertical rate of climb (VROC) of 450 fpm on a European day (2,000'/70ºF) by 200 fpm.

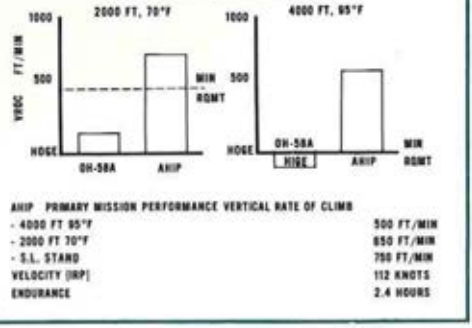
On a mid-East or hot day, it looks even better — against the Army minimum requirement to **hover out of ground effect (HOGE)** at 4,000'/95ºF, the AHIP will provide power margins to permit a VROC of 500 fpm. Airspeed will be 112 kts and mission endurance time will be 2.4 hours.

Hover and vertical climb capabilities are of course but a part of the NOE demands.

Controllability and maneuverability will be substantially improved. The AHIP will be able to achieve and hold a 2g pullup at speeds up to 100 kts and achieve and hold a zero g pushover.

Agility and maneuverability will be improved through a more acceptable ballance of control sensitivity and damping. Low speed controllability will be improved because of the AHIP ability to achieve and hold any desired hover heading in winds up to 35 knots from any direction. Takeoff and landing will be achievable on slopes up to 10º in any direction without limitation.

FIGURE 1—PERFORMANCE



As will be described later, drive train normal and transient power ratings are increased to permit pilot attention to his mission rather than aircraft power red lines. Through these improvements, and the incorporation of a three axis stability/control augmentation system including heading hold, pilot workload will be significantly reduced.

A major innovation

The major innovation on the AHIP is a **Mast Mounted Sight (MMS)** which permits target acquisition/designation while the scout remains in defilade — an airborne periscope, so to speak. The MMS capability exceeds the Army's stated minumum requirement for day target detection by 10% and night detection by 33%.

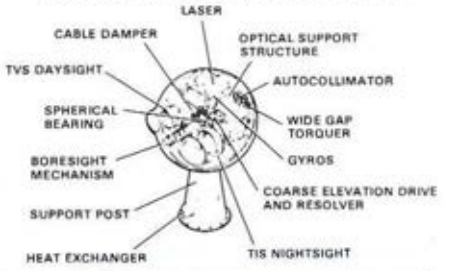
The minimum required target recogni-

FIGURE 2
MISSION WEIGHTS-LBS.

ITEM	PRIMARY MISSION	ALTERNATE MISSION
EMPTY WEIGHT*	2825	2825
A-A LAUNCHER & MISSILES	113	113
ALTERNATE EQUIP	--	104
FUEL & FLUIDS	804	834
CREW (INCL NVG)	474	474
MISSION WEIGHT	4016	4150

*INCLUDES BASIC MEP WEIGHT OF 578 LBS AND A-A STRUCTURAL PROVISIONS

FIGURE 3
MAST MOUNTED SIGHT SUBSYSTEM



tion ranges are exceeded by 20% both day and night. The percentages don't mean much — the specific ranges are classified — but most important is the fact that the ranges will provide a stand-off from threat systems which, when coupled with the MMS periscope effect, significantly enhances scout survivability.

Simultaneous and secure communication will be possible with multiple stations. Navigational accuracy (aircraft and target locations) will be that achievable with the latest state of the art equipment. Detailed equipment descriptions are provided below.

The above performance characteristics are based on a primary AHIP mission gross weight of 4,016 lbs. Mission weight buildups are shown in **Figure 2** and include the equipment, crew, and fuel required for the basic scout mission, plus a weight allowance for the multi-purpose lightweight **air-to-air (A-A)** missile launcher and missiles.

An alternate mission weight is defined for the scout so that, when required by the battle commander, a high frequency radio and security set can be added to the basic equipment package. **Is the OH-58A airframe capable of 4,000 lbs?** The answer is an unqualified "Yes." Under Army contract, static structural testing was accomplished on the OH-58 fuselage which proved the airframe was capable of gross weights of 4,500 lbs.

The Bell 406 AHIP provides the above capability enhancements while retaining the small size so vital to the scout NOE role and its survivability.

The AHIP will finally give the aeroscout a set of 24-hour eyes while assuring that the platform carrying the eyes can go anywhere the Army requires, anytime. But that's not all. There is growth capability. The mission equipment computers and processors (further defined below) have reserve, growth capabilities; 58% expansion capability for the computer; 48% for the processor.

There is a 33% growth capability in electrical capacity. This means that as the AHIP matures, equipment can be incorporated by adding it to the data bus and changing the computer programs (software) to accommodate it. Growth is not necessarily automatic or simple, but the margins are there to permit later improvements to the AHIP through "Block Improvement" programs.

Mission Equipment Package

The on-board mission equipment package consists of three major elements: the **Mast Mounted Sight Subsystem (MMSS)**; the **Controls and Displays Subsystem (CDS)**; and the avionics (Communication/Navigation) subsystem.

The MMSS

The primary component of the AHIP mission equipment package is the Mast

WHAT'S UP?

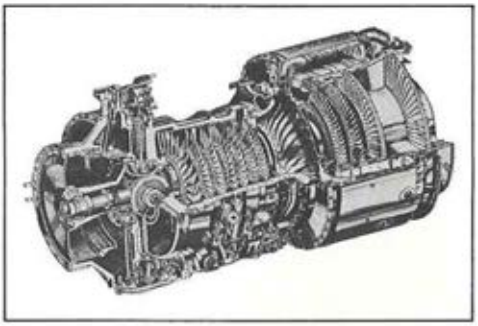
A more durable, safer Chinook, thanks to the T55-L-712 turboshaft.

The Chinook CH-47D is vital to the resupply of U.S. Armed Forces. The Army needs as many as possible in service to be at optimum effectiveness. That's why they've enlisted the help of the T55-L-712 turboshaft.

Under the RAM-D Program, this product-improved version of the T55 increases Reliability, Availability, Maintainability and Durability. Designed to log up to 2400 hours between overhauls. And the engine features an emergency rating of 4500 shp, providing additional safety for the aircraft and crew.

The 712 makes the Chinook easier to maintain. With less time on the ground. And more time in the air.

Avco Lycoming keeps working to make good engines even better.



AVCO Lycoming Engine Group
Lycoming Stratford Division
550 South Main Street • Stratford, CT 06497

Mounted day/night target acquisition/designation subsystem (**Figure 3**). The McDonnell Douglas/Northrop built subsystem is a 25-inch diameter sphere mounted atop a conical pylon which locates the sensor line of sight approximately 32 inches above the rotor.

The sphere contains a stabilized platform on which direct view sensors and a laser rangefinder/designator are mounted. There are two windows in the sphere, one visible and one infrared, through which the sensors and laser operate.

Acceptable night ranges

The night **thermal imaging sensor (TIS)** is based on a modified version of Northrop Target Acquisition FLIR built for the TADS/PNVS competition. The TIS uses the tri-service common modules and afocal optics.

The major modifications from the TADS version are the use of 'a split-sterling cooler and the replacement of part of the analog video electronics with a digital equivalent, the **digital scan converter (DSC)**. The dual field of view FLIR system (3° and 10°) provides the desired detection ranges and exceeds the minimum acceptable recognition night ranges.

The day sensor utilizes an 875 line silicon vidicon television. The high resolution TV system is designed to operate over a wide range of scene illumination, target/background contrast and atmospheric conditions. The silicon vidicon provides haze penetration and optimizes visibility in the near IR.

The dual field of view of the day sensor (2 degrees and 8 degrees) provides desired detection range performance and recognition ranges approaching the desired performance. The TV sensor and laser LRU's are mounted on a common optical bench and share a common telescope objective through a dichroic beam splitter.

The MMSS contains a **laser rangefinder/designator (LRF/D)** obtained from International Laser Systems, Inc. The LRF/D is similar to that being developed for the AAH TADS. Laser designation ranges utilizing the digital correlation autotracker are compatible with the acquisition ranges.

To maintain boresight between each sensor and the laser, a precision automatic inflight boresight capability based on the successful Norhthrop TADS boresight module is provided. Boresight can be accomplished automatically in less than 30 seconds by command from the observer.

The precision stabilization of the sensors and laser is achieved by utilizing the proven McDonnell Douglas **internal bearing stabilization (IBSSU)** technologies (single spherical bearing, helical spring and cable dampers, wide gap torquers, rate integrating gyros, autocollimaters) for the stabilized platform. The outer gimbal of the platform provides MMSS total field of ± 190 degrees azimuth and ± 30 degrees elevation.

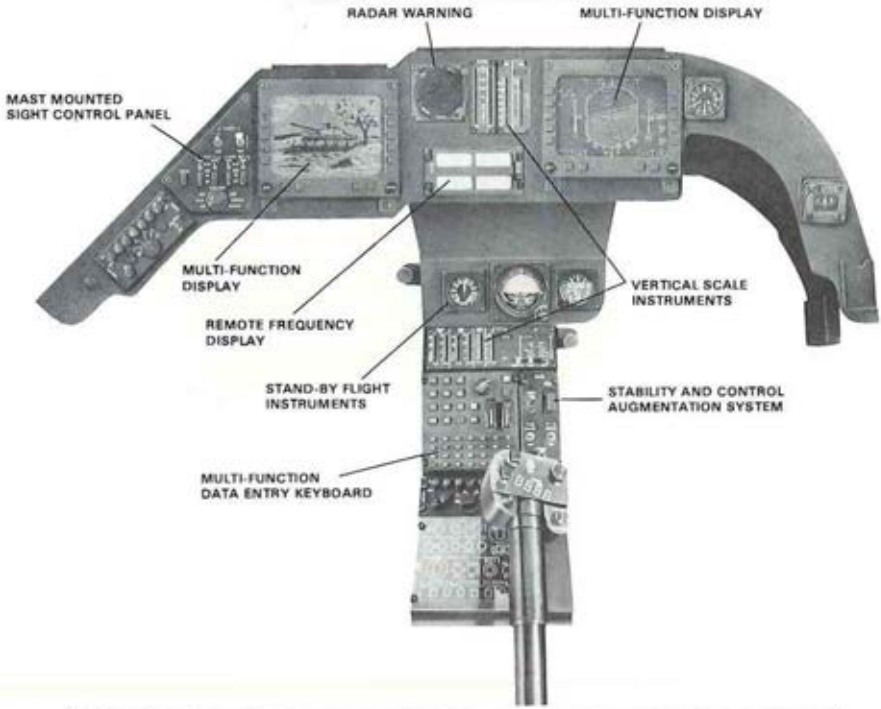
Controls & Display Subsystem

The AHIP mission equipment package includes the Army's first fully integrated multiplexed cockpit. The Sperry Flight System controls and display subsystem includes dual redundant MIL-STD-1553B multiplex data buses, dual identical multifunction displays, data entry keyboard, redundant mission computers, and symbol generators.

The integrated functions include a navigation and communication control and display, air data, radar altitude, automatic target handoff, a **Stability and Control Augmentation System (SCAS)**, a Fault Detection/Location System, caution/warning/advisory engine condition monitoring, and an MMSS control and display.

Figure 4 depicts the panel layoyut of the AHIP. The two identical multi-function displays offer four primary formats to either crewman. These formats are a **Ver-**

FIGURE 4 — AHIP DISPLAYS



tical Situation Display (VSD), Horizontal Situation Display (HSD), the MMS scene (including target handoff messages), and **Communications (COM)** display.

The crewman can "call up" any format at anytime by pressing a button on the face of the display, or the pilot may select his display format from controls on his cyclic stick. This full "hands on" control will be discussed below.

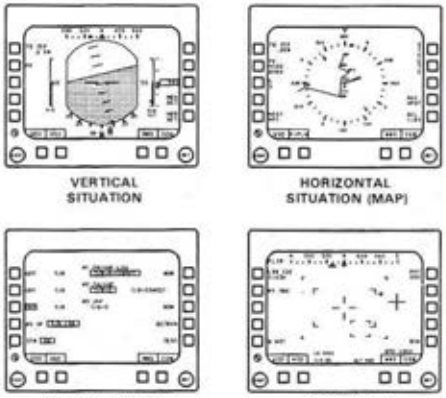
The familiar "round" gauges in the low center of the cockpit are there for **standby use** only. In the unlikely event of failure of two displays, two computers, and two symbol generators, the scout crew could return to base using these stand-by instruments.

Vertical scale instruments are provided for all engine and rotor parameters; although by routing their sensor inputs through the computer, the pilot can fly with all his attention outside the aircraft for NOE maneuvering while the computer system monitors all engine and rotor parameters. Should something require pilot action, the system calls his attention to the multifunction display where the problem is described to him.

Reduced scout crew workload

This fully automated trend and limit warning/caution/advisory system frees the scout crew for critical decision-making and eliminates the workload of constant

FIGURE 5—SELECTABLE MODES FOR MULTIFUNCTION DISPLAYS



monitoring of aircraft performance parameters.

Figure 5 illustrates the four primary formats. The VSD offers attitude, altitude, heading, and turn rate information while the HSD displays heading and flight plan route (34 waypoints or targets may be stored in memory), plus bearing and distance to the next waypoint. When a crew member selects MMS, a picture from the MMS sensor (TV or TIS) is presented with pertinent data overlaid to allow the co-pilot/observer to select, track, handoff, and designate targets.

A master radio control head

The last primary format available, COM, is actually a control head for all radios in the AHIP. Through the computer, the crew can turn on or off all radios, change their mode of operation or select frequencies. This one display replaces five separate control heads on the instruments panel.

FIG. 6—MISSION EQUIPMENT PACKAGE

SENSOR SYSTEM

MAST MOUNTED SIGHT

- MAST MOUNTED SIGHT SUBSYSTEM
- CONTROLS AND DISPLAYS SUBSYSTEM

COMMUNICATIONS

VHF-FM	- AN/ARC-186
VHF-FM	- AN/ARC-186
IMPROVED FM	- BOOSTER
FM HOMING	- CM-492
UHF-AM	- AN/ARC-164
VHF-AM	- AN/ARC-186
SECURE DEVICES	- KY-58 (2)
HF/SSB	- PROVISIONS
INTERCOM	- C-10414 (2)

AUTO TARGET HANDOFF

NAVIGATION

- DOPPLER - ASN-137
- AHRS - LR-80
- BACK UP - AN/ASN-43
- RADAR ALTIMETER - AN/APN-209
- AIR DATA SENSOR

MISCELLANEOUS AVIONICS

IFF	- APX-100
IFF SECURE	- KIT-1A
KY-75	- PROVISIONS
RADAR WARNING	- APR-39

TOTAL MEP WEIGHT - 579 LBS

Avionics

Figure 6 describes the remainder of the 579-lb. Mission Equipment Package by function. The AHIP includes a very accurate **Doppler/Inertial Navigation System (AN/ASN137/LR-80)**. Navigation computations are accomplished via a 14 state Kalman filter residing with the **Attitude Heading Reference System (AHRS)** which processes continuous doppler velocity inputs to yield refined estimates of velocity attitude and position. Back up navigational capability is provided by retaining the AN/ASN-43.

The navigational system is interfaced with the MMS through the computer to provide precision target location solution, navigational updating, and MMS prepointing to known target locations. To achieve the target location accuracy the AHIP measures the motion of the transmission pylon using a **transmission attitude measuring system (TAMS)**. The data is processed by the computers to compensate for relative angular motion between the MMS turret and the navigational system.

The AHIP is equipped with an automatic target handoff system which provides no voice, digital data burst communications with the Advanced Attack Helicopter and the TACFIRE artillery system.

The communications system

The AHIP communications system provides the desired capability of five simultaneous communications bands. This is accomplished by three remote versions of the AN/ARC-186 multiband radio, one AN/ARC-164 radio and one AN/ARC-174. Two ARC-186 radios provide the dual VHF-FM capability, while the third ARC-186 is used as the VHF-AM radio.

The ARC-164 provides the UHF-AM communications. NOE communication is enhanced by the improved FM (IFM)

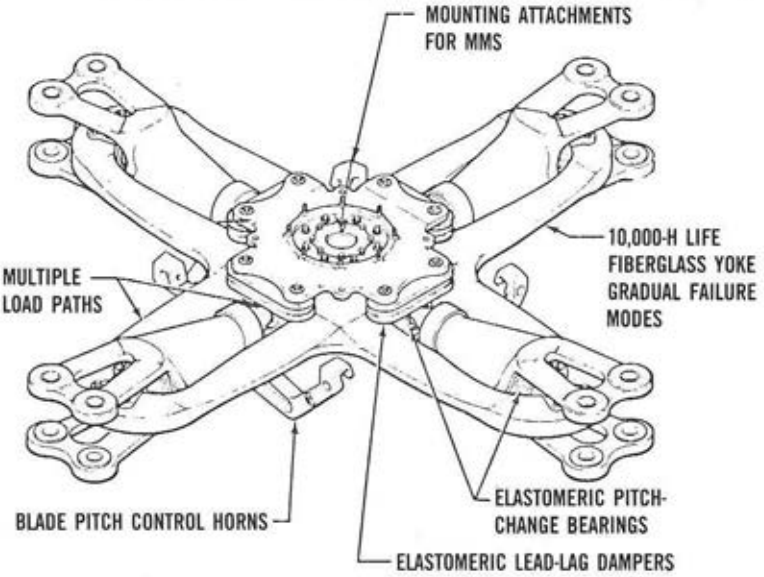


FIGURE 7 — MAIN ROTOR HUB

amplifier and provisions for the ARC-174 modified for retransmission provides the HF/SSB communication. Communication security is insured by the installation of KY-58's with the UHF/VHF radios and provisions for a KY-75 for use with the HF/SSB radio.

The OH-58 rear passenger compartment is converted into the avionics/electronics bay.

Air Vehicle

Agility, maneuverability, power margin — these performance characteristics are all critical to the scout crews survivability and mission accomplishment. Carefully engineered design changes will modify the OH-58A into the AHIP Bell Model 406 to provide these critical characteristics and improve the AHIP Model 406 capabilities substantially above those of the current OH-58 aircraft.

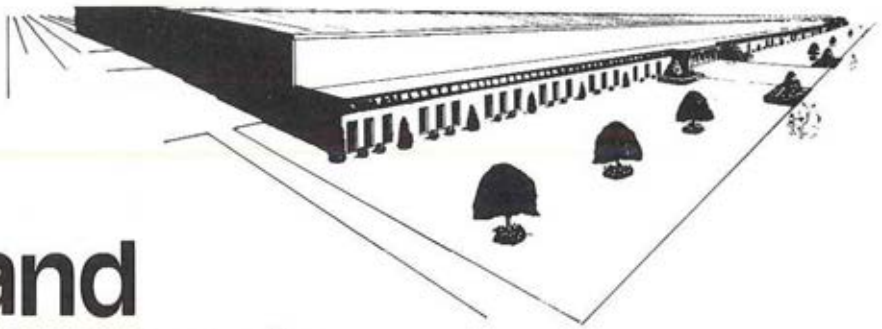
Minimum Modifications

Only minimum structural modifications are needed for the basic OH-58A airframe to accept the new dynamic systems and mast mounted sight which are the heart of the AHIP Model 406.

The forward fuselage structure is modified to accommodate a new instrument panel, a nose battery compartment, and nose and roof-mounted wire cutters. The cockpit roof is also recontoured to provide additional headroom for the crew. The mid-fuselage structure is modified for installation of a new pylon support system, avionics support racks, and an increased capacity fuel cavity.

The fuselage roof is modified in the area aft of the rear engine firewall to mount a larger oil cooler and blower system. The OH-58A tailboom structure

It's your museum



and it needs your support! Not later, but now!

It's your museum and it needs your personal support! Not later, but now!

MOST OF this magazine's readers know that the Army Aviation Museum at Fort Rucker has what is believed to be the world's largest collection of helicopters of all types on public display.

THEY ARE also familiar with the fact that in the past ten years more than one million museum visitors have enjoyed seeing and learning how these remarkable aircraft were developed.

BUT THE VIEW of Army Aviation presented at this World War II facility still leaves much to be desired. THE BUILDINGS are old, and getting older by the month; the paint is peeling off the ceiling onto the floor; other than the general office area, visitors find the buildings hot, musty, and overcrowded with exhibits.

NOTHING HAS CHANGED. The World War II buildings are still **not fireproof,** and the humidity inside the museum still promotes rust and further deterioration of aircraft and other memorabilia.

WITH ITS indoor space so limited, the museum still stores a great many aircraft out of doors subjecting them to the elements. Many show definite signs of deterioration; interiors are fading or rotting due to sun damage.

SO SOMETHING had to be done.

RECOGNIZING the need for a new facility, an **Army Aviation Museum Foundation, Inc.** was incorporated in 1970, and has worked continuously since that date to generate the donated funds necessary to underwrite a new museum facility.

THE FOUNDATION is a perpetual organization; the development program **is not.** The eventual facility is to be constructed on a site chosen by the Ft. Rucker Planning Committee.

WHEN COMPLETED, the museum will be donated to the Army by the Foundation. The museum will then be operated by the military and staffed with DAC personnel, and the Museum Foundation will continue to play a supporting fiscal role.

OVER THE past three years, the Foundation has solicited your support and financial aid to underwrite a facility that would properly display and protect the $60 million collection of Army aircraft and memorabilia. It recently reached the $500,000 mark in donations and pledges.

IT FEELS certain you're aware of the beautiful **Air Force Museum** at Wright Patterson AFB in Ohio, the **Naval Aviation Museum** in Pensacola, Fla., the new **Marine Aviation Museum** in Quantico, Va., and the equally new **Transportation Corps Museum** at Ft. Eustis, Va., all four of which house outstanding aviation collections properly.

THE POINT is that the Museum needs **your** individual help. Your personal contribution is welcome. No contribution is too small or too large to help in building the new Museum.

PLEASE CONSIDER making a tax-deductible Museum donation today! A tear-out coupon is found on the opposite page. Return the coupon to AAAA with your check or pledge and help to build a Museum of which all of us may be proud!

It's your museum and it needs your personal support!

CHARTER MEMBERSHIP—Contributions of $1,000. The individual names will be engraved on individual plaques.

LIFE MEMBERSHIP—$100 contribution. The names of Life Members will be engraved on a permanent plaque.

"IN MEMORIAM" SPONSORSHIPS—$100 contributions. The memorialized person's names will be engraved on a permanent plaque.

ANNUAL MEMBERSHIPS—Annual contributions of $10.00.

CHECK ONE: ☐ Charter Membership, $1,000.00; ☐ Life Membership, $100.00; ☐ Annual Membership, $10.00

PLEASE CREDIT THIS CONTRIBUTION OF $__________________TO:

PLEASE PRINT NAME______________________________

ADDRESS______________________________

CITY______________________ STATE ______________ ZIP ______________

Your contribution should be made payable to the "Army Aviation Museum Foundation, Inc." and mailed directly to the Foundation, Box H, Fort Rucker, Alabama 36362. For additional information, contact Colonel H.E. Brown, Ret., Director of Development, Army Aviation Museum Foundation, Inc., (205) 255-4584.

is adapted for mounting of a larger diameter tail rotor drive shaft, a higher rated tail rotor gearbox, and improved aerodynamic performance horizontal stabilizer.

The AHIP Model 406 skid landing gear incorporates stronger crosstubes due to increased mission gross weight. The fuselage will also include structural hardpoints for pylons for the A-A self defense subsystem.

An improved rotor system

The AHIP Model 406 will have outstanding agility as a result of a four-bladed main rotor system which incorporates the BHT soft-in-plane, flex beam design. The main rotor blades have a 35 ft. diameter and 9.6-in. chord and are constructed primarily of fiberglass making them lightweight (50 lbs. each) and more damage tolerant. The blade design uses a high lift airfoil inboard of 70% radius and transitions to a high speed airfoil at the blade tip. The blade is protected from sand and rain erosion by a field replaceable polyurethane abrasion strip from the root to 60% radius and a depot-replaceable nickel plated steel abrasion strip from 60% radius to the tip.

The heart of the Model 406's hub (**Figure 7**) is a composite yoke made of filament-wound fiberglass/epoxy belts. The pitch change bearings and lead-lag dampers are elastomeric elements that require no maintenance and have gradual failure modes. The composite construction of the hub and blades results in longer fatigue lives and a structure that is damage tolerant, allowing a return to base even after a bullet or minor tree strike.

To complement the improved main rotor system, the AHIP Model 406 also incorporates an increased effectiveness tail rotor which will allow precision hovering

FIGURE 8 — DRIVE SYSTEM FEATURES

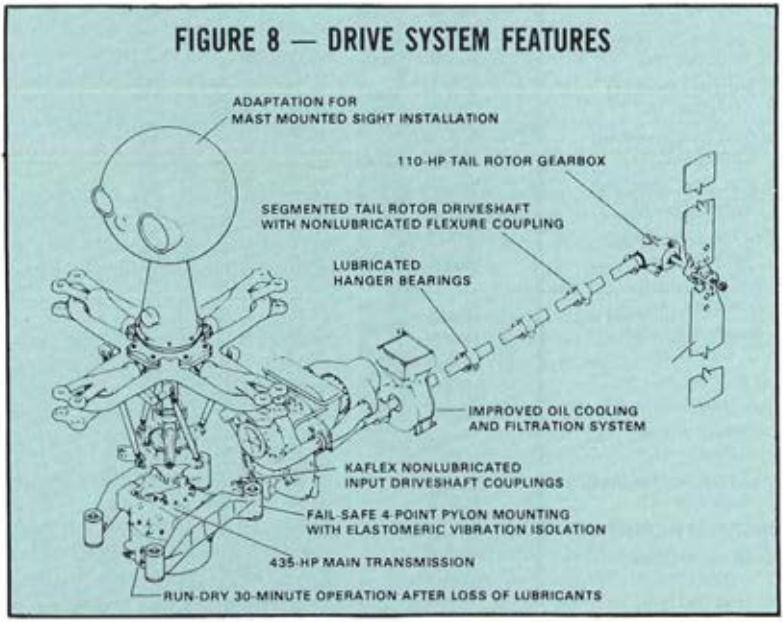
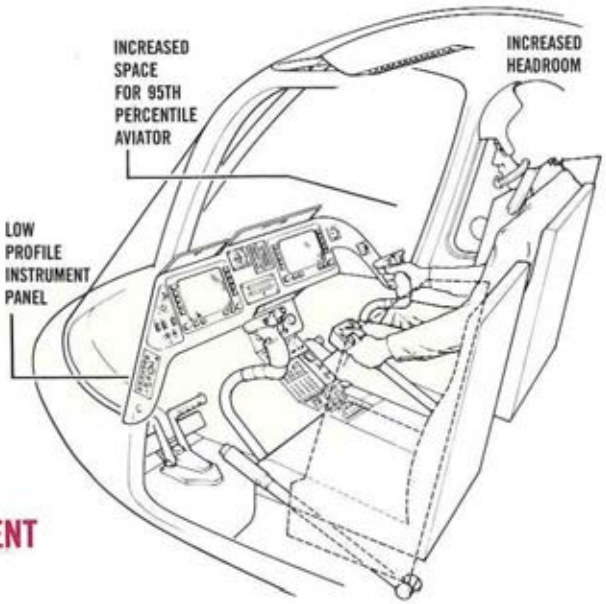


FIGURE 9



COCKPIT ARRANGEMENT

in winds to 35 knots from any direction. This tail rotor system consists of fiberglass blades, a steel yoke, and spherical teflon lined pitch change bearings. The blades have a 5.42 ft. diameter, a 6.35-in. chord and weigh only 13 lbs.

Figure 8 presents the major components of the AHIP drive train. The main transmission has a continuous rating of 435 hp measured at the mast and a transient rating of 609 hp. It is a two stage speed reducer which is designed for a 30 minute run-dry capability and a 1,200 hour minimum life for bearings and gears.

The tail rotor gearbox design is very similar to the OH-58A gearbox, except the gears and bearings are re-sized to accommodate a power rating of 110 hp continuous and 220 hp transient. Both the main and tail rotor gearboxes utilize capacitive discharge discriminating chip detectors to warn of impending component failure.

Power for the tail rotor gearbox is provided through a larger segmented drive shaft with sealed bearings and non-lubricated flex couplings. This larger shaft is more survivable to gunfire and allows changing of a bearing by removing only one section of drive shafting.

A more powerful engine

The Allison 250-C30R engine powers the AHIP Model 406. This engine not only provides the necessary performance to utilize the improved drive system capability but ensures increased operation "in the green" by the substantial improvement in available power — 650 shp at Intermediate Rated Power — over the OH-58.

The basic 250-C30 engine has already been certified by the FAA. The engine model to be utilized on the AHIP, the 250-C30R, will incorporate a supervisory electronic control for increased reliability and improved governing, factors which

will enhance its suitability to the AHIP mission. The electronic control will also provide engine trend and limit warning data to the CDS for display to the pilot.

The 250-C30R is scheduled for certification in mid-1982. Additionally, the engine will utilize a suction fuel system for added safety and an advanced technology centrifugal compressor for improved performance in an inherently more rugged design.

Improved survivability

Another significant aspect of the AHIP, in addition to its performance and mission capabilities, is its improved survivability when compared to the OH-58A. The AHIP has a 54% vulnerable area reduction against a 7.62mm threat. The survivability will, of course, be greatly enhanced by the concealment capability provided by the MMS.

The aircraft also incorporates an IR suppressor, radar warning system, engine armor, low reflective paint and a 30 minute run-dry transmission — all of which will increase survivability. The hydraulic subsystem is also fail-safe in that manual control of the aircraft will still be retained in the event of hydraulic boost failure or complete loss of hydraulic power.

In addition to the improvements made to the basic OH-58 to provide increased performance and survivability, modifications have been made to make the cockpit more comfortable for the aeroscout pilot. The general cockpit arrangement is presented in **Figure 9.**

The 95th percentile aviator no longer has to slump or lean over to provide head clearance. The AHIP cabin roof has been redesigned to provide additional head room and to facilitate reading the switches and circuit breakers placed overhead. This head room, plus an adjustable cyclic stick and anti-torque pedals, insure that scout pilots of all sizes can comfortably fly the AHIP.

The pilot has full control of his multifunction display and all five radios without removing his hands from the controls — an added safety factor when operating NOE. The co-pilot/observer operates the sight from his cyclic stick grip. This stick is locked out of the cyclic control system for normal operations, but the flip of a lever will allow the co-pilot/observer to enter the cyclic system to control the aircraft.

Additionally, cockpit lighting in the Model 406 is fully compatible with third generation night vision goggles, as are all AHIP lighting systems.

Summary

It should now be apparent that the Model 406 AHIP is not just a helicopter with a sighting capability added. And make no mistake, it is not an OH-58A. It is instead a full-up, fully integrated surveillance target acquistion, designation system, operational and fully maneuverable in the NOE environment.

Careful attention has been paid to the capability of the scout crew to perform their mission under almost all combat conditions and the Model 406 AHIP boasts the most advanced cockpit yet to fly on any helicopter. As stated earlier, the true winner in this program is the US Army scout crew.

The AHIP Aeroscout will permit acquisition and recognition of targets during day, night, and adverse weather in the European and hot day NOE role. It will handoff targets or designate for AH-64 launched **HELLFIRE,** cannon-launched precision guided munitions (**COPPERHEAD),**and other precision-guided and conventional rounds, and it maximizes survivability for the scout and crew.

See without being seen, 24 hours a day, good weather and bad with the newest member of the combined arms team — the US Army Helicopter Improvement Program Scout Helicopter.

by John A. Bartin and
Victor W. Welner

Reliability and readiness

The AHIP Program presents some unique and challenging opportunities in designing, testing, producing, and fielding a reliable supportable system capable of performing its role on the modern battlefield.

Here is a brief overview of the hardware characteristics which will ensure accomplishment of the reliability and supportability goals. The traditional engineering effort consists primarily of:

(1) improving the existing OH-58A airframe to allow achievement of more demanding performance requirements and

(2) developing and integrating a mission equipment package to provide state-of-the-art communication, navigation, and target acquisition/designation capability.

During this effort, however, there is also the opportunity to consider and design for improved reliability and logistics support. First we will look at the reliability aspects of the program.

Airframe Reliability

The OH-58A has experienced over ten years of field operations. During that time, service related problems have been identified and documented, and we now have the opportunity to correct many of these problems at the same time that performance improvements are being made.

JOHN A. BARTIN SERVES AS CHIEF OF THE LOGISTICS MANAGEMENT DIVISION OF THE ASH PMO WHILE CO-AUTHOR VICTOR W. WELNER IS CHIEF OF THE PRODUCT ASSURANCE DIVISION/TEST DIVISION IN THAT OFFICE.

Significant Advancements

In addition, we can take advantage of significant technological advancements since the initial fielding of the OH-58. Here is a sampling:

The AHIP main rotor hub uses a glass fiber main rotor flexure and elastomeric bearings. The hub assembly is more reliable than the OH-58 main rotor hub and eliminates problems such as seal leakage, bearing failure, and yoke scoring. The AHIP damage-tolerant main rotor blade, with its nickel leading edge guard on the outboard ⅓ of the leading edge, and field replaceable polyurethane coating on the inboard edge offers an effective configuration for operation in an erosive sand environment. The frangible tip is also field replaceable.

The tail rotor hub and blade assembly, with an elastomeric flapping bearing in the tail rotor hub, and a fiberglass tail rotor blade, provide corresponding reliability and maintainability improvements.

The reliability improvements of the AHIP swashplate assembly include a

FT. MONMOUTH, NJ—Shown being congratulated on receiving his Master Aviator wings is LTC Charles W. Millican, left, ExecO at the Avionics Research and Development Activity. Presenting the documents is COL Darrold D. Garrison, the AVRADA Commander and President of AAAA's Monmouth Chapter. BELOW: In a follow-on ceremony, COL Garrison then presented Senior Army Aviator wings to CPT Robert E. Britt, an Electronics Engineer in the Plans and Analysis Division at AVRADA. (Special report by Bobbi C. Campbell; photos by Matti Feder)

tungsten-carbide coating for the swashplate support and a larger bearing in the pitchlink.

The main transmission incorporates vacuum-melted M-50 steel bearings for the input pinion triplex ball bearing and the planetary support bearings, a magnetic carbon input seal for the input quill, and a change to a straddle-mounted input spiral bevel gear from the current overhung-mounted configuration to reduce deflection.

The input drive shaft is changed to Kaflex type, thus eliminating leakage and coupling wear. A circumferential ring carbon seal prevents oil leakage from the forward seal of the freewheeling assembly.

The AHIP electrical power system consists of essential and non-essential buses with automatic switching to backup power in the event of a failure. Primary power is AC with a **Transformer Rectifier Unit (TRU)** for conversion to satisfy DC power requirements.

The engine starter/generator and AC inverter are backup power sources inflight with the battery system providing even further emergency electrical power. The system is designed so that no single electrical failure will cause loss of any system essential to tactical instrument flight.

The AHIP three axis digital **Stability and Control Augmentation System with Heading Hold Mode (SCAS-HHM)** incorporates redundancy and modeling techniques to provide failure protection to the pitch, roll, and yaw SCAS channels.

Mission Equipment reliability

The **Mast Mounted Sight (MMS)** sensors are stabilized by an **Internal Bearing Stabilized Sighting Unit (IBSSU).** This provides a low vibration environment thereby reducing failure rates. In addition, cooling air is provided to the Mast Mounted Sight in order to keep electronic components operating at acceptable temperatures.

Incorporation of an **Electronic Multiplexor (E-MUX)** instead of an **Electro-Optical Multiplexor (EO-MUX)** in the night sensor eliminated the need for a **Light Emitting Diode (LED)** array, visual collimator, and post amplifiers which should greatly increase MMS reliability over current night sensor designs.

The AHIP **Control and Display Subsystem (CDS)** has design features which enhance mission reliability. The CDS has two **Master Controller Processor Units (MCPU)** which provide redundancy for processing critical aircraft interface signals; therefore, in the event of a single point failure, the CDS will continue to operate with sufficient operational backup mode capability to continue the mission.

The AHIP design incorporates a **Fault Detection/Location System (FD/LS)** for subsystems of the **Mission Equipment Package (MEP).** The FD/LS provides an

aircraft fault detection and isolation to the **Line Replaceable Unit (LRU)** level. This capability will reduce or eliminate the AVUM **Peculiar Ground Support Equipment (PGSE)** requirements for the monitored subsystems and provide a rapid and effective fault detection capability which will reduce turnaround time and increase availability.

The concept is one of integrating existing subsystem **Built-in-Test (BIT)** status signals and self test diagnostic fault isolation outputs into a centralized data gathering, display and recording system through a redundant multiplex data bus, a central computer, and a **Multi-function Display (MFD)** which are part of the CDS.

Reliability Verification

A sound design alone, however, does not guarantee achievement of acceptable levels of reliability. Extensive testing to identify reliability problems will be conducted, thus verifying the level of achieved reliability and identifying areas of potential reliability growth.

Environmental stress screening tests will be performed as part of quality acceptance process for selected electrical, electronic and electromechanical items that are unique to the AHIP. Reliability development/growth tests will be included for electrical, electronic, and avionic equipment unique to the AHIP to assure that during their development they have the opportunity to grow to their specified reliability.

However skillful and dedicated we are, parts will eventually wear out or fail and preparation for field supportability is beginning now.

Logistics Support

One of the greatest challenges in the AHIP Program is the task of fielding the AHIP with its much expanded performance capability and fully integrated mission equipment package, as a system that is indeed supportable at the AVUM/AVIM level without significant impact on cost or manpower. However sophisticated the system may be, it is of no real value unless it is "ready".

Initial design efforts have stressed supportability and readiness. A significant amount of progress has been achieved in the areas of reliability, accessibility and AVUM fault isolation, but we expect more. Design/support trade-off studies are part of the development contract and will continue through the Full Scale Engineering Development of the acquisition process.

The process of meeting the support challenge will be controlled by a multi-command **Integrated Logistic Support Management Team (ILSMT)** co-chaired by key PM/AVRADCOM and contractor ILS management personnel. The only measure of our success will be in affordable and consistently demonstrated readiness.

Here is a brief description of where we stand in some of the more significant logistic functions.

Maintenance Planning Internal Evaluation Division

The current OH-58A/C **Maintenance Allocation Chart (MAC)** will be used as a baseline in developing the AHIP MAC which will include the new airframe, engine and communication/navigation components. A completely new MAC will be developed for the MEP and its components.

The AHIP will continue the aviation three level concept of AVUM, AVIM, and Depot. There will be some variance for communication/navigation components which can utilize the AN/USM-410 **Automatic Test Equipment (ATE)** currently being established at selected general support units. AVUM maintenance will utilize the built-in **Fault Detection Location System (FSLS)** along with the **Skill Performance Aid (SPA)** technical manuals and trouble shooting charts for locating faculty **Line**

Replaceable Units (LRUs), system interface, wire bundles, plugs, etc.

Approximately 60% of the mission equipment LRU's will be repaired at the AVIM level using the AHIP test equipment to fault isolate bad boards, modules, and components. The remaining LRUs and repairable modules will be evacuated to the depot-level for repair.

Manpower and Personnel

A tentative **Qualitative and Quantitative Personnel Requirements Information (QQPRI)** study has been accomplished which resulted in some early MOS decisions. Now that the OH-58 airframe has been selected and its development process is on-going, the QQPRI is being reviewed with recommended revisions submitted in January of 1982.

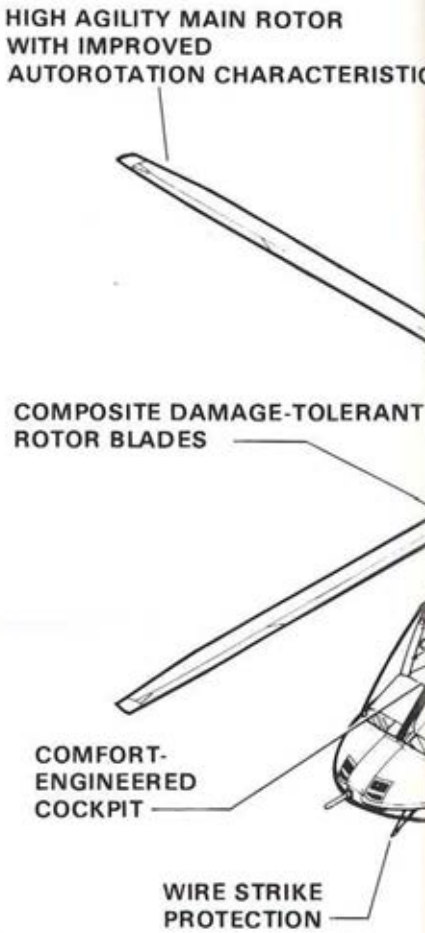
Areas of major consideration are in the selection of the Aerial Observer (Co-pilot? Enlisted? MOS? training?) and the MOS(s) for AVUM/AVIM mission equipment repair including test equipment operation and maintenance. Of particular importance is the selection of the Observer/Mission Equipment Operator and the establishment of a flight training program.

Supply Support

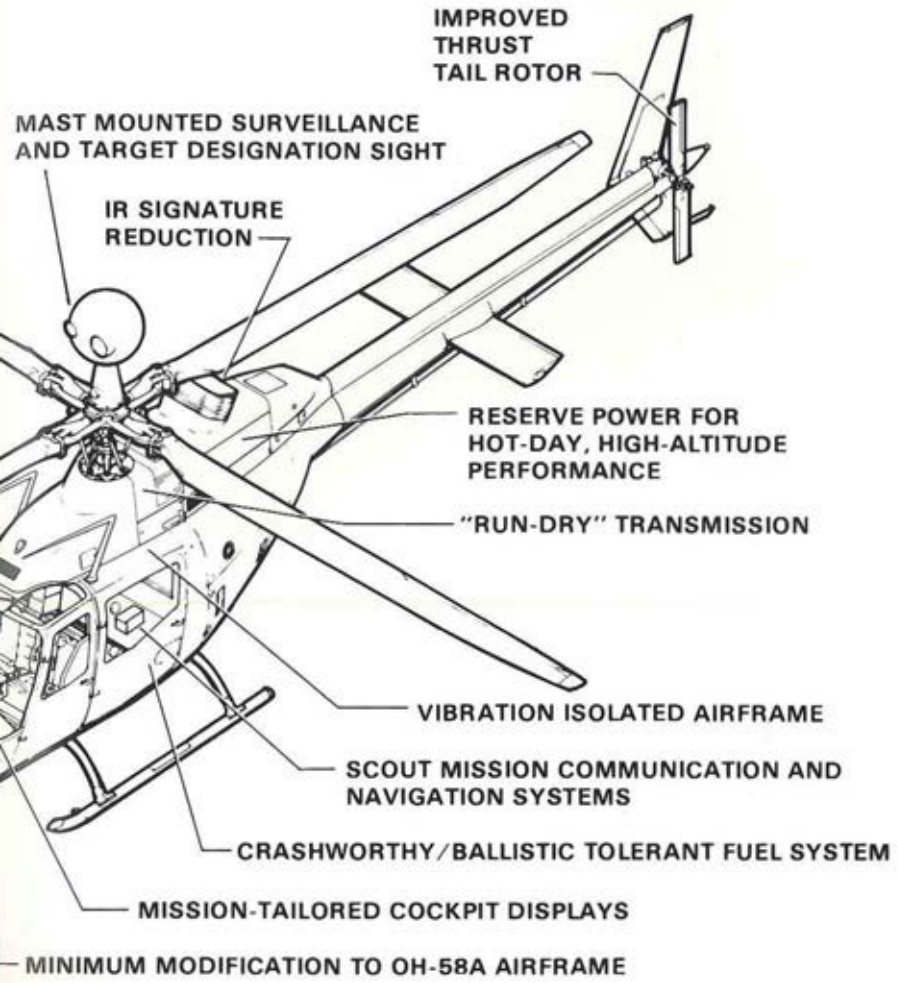
AHIP will use existing OH-58A/C stock of spares, repair parts, and ground support equipment where possible. Deployment of the AHIP will require an intensive management effort to prevent a large scale relocation of common items currently on-hand in existing units. Planning is in process to provide sufficient AVUM/AVIM spare and float mission equipment LRUs for those items to be assigned to a depot for repair.

The hardware portion of the **Development Test/Operational Test (DT/OT)** System Support package will be representative of the fielded AHIP **Authorized Stockage List/Prescribed Load List (ASL/PLL)** with joint contractor/Army input, and when combined with the demand

AHIP MODE



406 DESIGN FEATURES



data generated in testing, it will give us good data base for supply planning to support fielding.

Support and Test Equipment

New components, a heavier helicopter, new mission equipment, and many assorted system improvements dictate a new set of support equipment. In all cases, the AHIP will use existing equipment where possible, or modified equipment if feasible.

New items will be developed only after Army approval and will be given a thorough evaluation during DT/OT. AVIM testing of the mission equipment will utilize a unique packaging of common equipment revolving around the Hewlett-Packard "F" series processor and S-576 shelter. It will be capable of operating independently or combined with Depot ATE, and of being transported either by 2-1/2 ton truck or by air.

Basic benefits of this approach are that the test equipment will be developed with full Army involvement on the FSED contract which mandates a formal Logistic Support Analysis, with proof that it works and can be maintained in the field. Further, the shelter provides for MMS field build-up with adequate environmental protection, the test and repair of selected components, and full compatibility with the depot AN/USM 410 test equipment.
This concept provides a support capability without a large quantity of discrete test sets and avoids the extreme cost and personnel impact, of providing a factory test capability at the AVIM level.

Training and Training Devices

Training currently under contract is that required for staff planning, maintenance, observer and pilot courses to support the development testing. Deliverables to be provided include task and skill analyses, training aids and device studies, training courses, instructor guides, required audio-visual aids and training hardware to support the testing and demonstrate overall "trainability" of AHIP systems.

Combination mission/flight simulator need documents are currently being staffed within TRADOC. Agreements are pending between ASH PM and **PM-Training Aids and Devices (PM-TRADE),** regarding the development of simulators and training devices.

The New Equipment Training Plan, to include proposed **New Equipment Training Teams (NETTs),** has been developed by TSARCOM and is currently being coordinated with all concerned.

Publications

New manuals will be developed for TM 55, 9 and 11 series publications. The- 10 (operators) manual will include instructions on all mission equipment functions, operation and use. All maintenance handbooks will be in the SPA format.

Contractor validation will be accomplished, in all cases, with a "hands on equipment" approach. Army verification will be initiated at the beginning of DT and be continued throughout DT/OT and after, as required, until completed.

The Bottom Line

The AHIP by taking advantage of airframe performance changes to incorporate reliability improvements, by applying sound design principles to the newly designed MMS and CDS, and by conducting an extensive development test program will provide a reliable system ready for battle. We have a long way to go and much to do, in fielding a very reliable, supportable system that can be easily maintained in the field.

The ASH PM will continue to rely on the Logistic support Analysis principles abd will fully cooperate with the Army development/readiness community, TRADOC, and the gaining commands that will eventually use the AHIP. Reliability, supportability, performance, and affordability are our most important products.

by COL Robert S. Fairweather, Jr.

The AHIP scout helicopter's team

THE TRADOC SYSTEM MANAGER, COLONEL ROBERT S. FAIRWEATHER, JR., DETAILS THE MISSIONS, ORGANIZATION, AND PERSONNEL ASSIGNED TO THE OFFICE OF THE TRADOC SYSTEM MANAGER-SCOUT HELICOPTER.

The Office of the **TRADOC System Manager-Scout Helicopters (TSM-SH)** was established 1 July 1977 with the mission to conduct total system management for scout helicopter systems within TRADOC.

The TSM-SH, acting for the Commander, USAAVNC, and the Commander, TRADOC, has a broad charter authorizing him to be the user's representative in the development, testing, training, and fielding of scout helicopter systems. Specifically, he represents the user in all matters concerning scout helicopters and in the management of the existing OH-58/OH-6 fleet.

The TSM's tasks focus on three functional areas: Doctrine, Tactics and Testing; Logistics; and Training/Personnel. The office is currently staffed with a Deputy TSM for AHIP Coordination and three officer assistants who specialize in the functional areas.

The Deputy TSM for AHIP Coordination, **LTC Skip Neuwien,** is the technical expert on the Army Helicopter Improvement Program and principal advisor to the TSM on matters concerning contractual requirements and AHIP specifications.

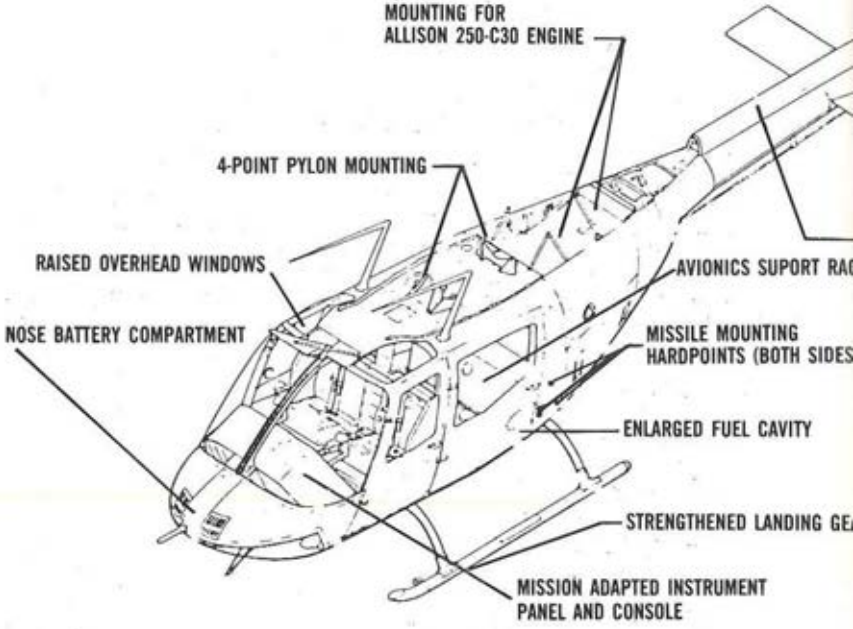
As the Director of the Operational Suitability Area on the AHIP **Source Selection Evaluation Board (SSEB),** he provided the knowledge and insight necessary to insure that the user's needs were clearly understood and incorporated in the aircraft configuration.

Doctrine integration

The Assistant TSM for Doctrine, Tactics and Testing, **Major Laurie Pope,** insures that current doctrine and tactics are integrated into scout-related mission profiles, operational concepts and operational characteristics. This must be accomplished early in the system life cycle to insure that the testers, analysts, and decision makers have the essential information to avoid costly mistakes or misunderstandings on proper employment techniques.

He is also responsible to insure that adequate testing is planned and conducted throughout the materiel acquisition process to determine how well the system meets its technical and operational requirements. This includes insuring that all critical issues that can be resolved by

FUSELAGE STRUCTURAL MODS



testing are included in the test planning process.

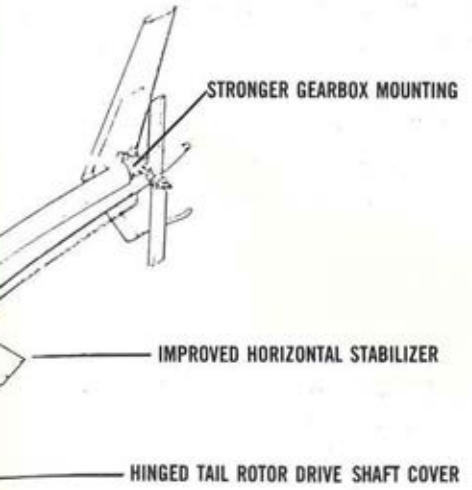
Logistic readiness

Another important staff officer is the Assistant TSM for Logistics, **Major Tom Konkle,** who monitors all aspects of logistics readiness and preparedness for developed and developing systems. He is responsible to the TSM for executing his responsibilities as the TRADOC ILS Management Team Chairman.

Major Konkle insures that essential **reliability, availability, and maintainability (RAM)** characteristics, as well as transportability and other support requirements, are adequately defined as logistic guidelines for the materiel developer and other agencies.

In conjunction with other TRADOC schools and centers, the Assistant TSM for Logistics defines the logistical environment and establishes the logistical doctrine and organization necessary to support and maintain the scout helicopter systems during the conduct of operational tests and upon deployment to the field.

The fifth member of the TSM-SH team



is the Assistant TSM for Training and Personnel, **Major Grant Fossum,** who is responsible for coordinating the development of training literature, programs, devices, and related materials needed to support scout helicopters and for determining how, when, and where training can best be accomplished.

He also coordinates the development of personnel requirements for the soldiers who will operate and maintain the scout helicopters. Included are human engineering considerations, task and skill analyses, organizational structures, operator/maintainer qualifications and development of the **Basis of Issue Plan (BOIP)** and **Individual and Collective Training Plan (ICTP).**

To effectively represent the user in all facets of scout/observation fleet management, the TSM office must establish and maintain communications with the proponent centers and unit pilots who fly the helicopters every day. To this end, we have developed an excellent rapport with the U.S. Army Armor Center, Fort Knox, Kentucky, and the U.S. Army Field Artillery Center at Fort Sill, Oklahoma, who have proponency for aeroscout and artillery observer aircraft, respectively.

Tactics and doctrine

The proponent centers develop tactics and doctrine and are the focal points for coordination on all issues involving scout helicopter personnel, training, testing, and logistics. Additionally, we have conducted user conferences at least twice annually to update representatives from the major commands and obtain their feedback on the tactical units' evaluation of current systems and desired improvements to enhance their capability to perform the demanding scout mission.

Though constrained by budget limitations, we have recently embarked on a program to visit all major units to brief on the AHIP and gather the first-hand comments and recommendations needed to insure that we truly represent the needs of the aircrews in the field.

The TSM Scout Helicopters team exists to serve the user and to provide an interface with the developer community and all other appropriate agencies. We continually strive to provide the best scout helicopter systems possible to fight the next battle.

We encourage your comments and suggestions to help us do our job better and can be contacted by calling AUTOVON 558-3808, or writing Commander, U.S. Army Aviation Center, ATTN: ATZQ-TSM-S, Fort Rucker, AL 36362. ■

by Earl T. Gatlin

The role of the project manager

The ASH Project Manager has been delegated the full line authority of the CG, U.S. Army Materiel **Development and Readiness Command (DARCOM),** through the CG, U.S. Army **Aviation Research and Development Command (AVRADCOM),** for the centralized management of the **Army Helicopter Improvement Program (AHIP).**

The ASH-PM is responsible for the development, materiel acquisition, and materiel introduction of the AHIP. Implicit herein is the correlation of AHIP program accomplishments with longer range development efforts, designed to optimize planning for future attainment of the full ASH capability which is required.

The ASH-PM charter updated and approved by the Secretary of the Army on 5 October 1981 defines the above mission and charges the PM to develop and acquire the AHIP system on schedule and at the lowest practical life cycle cost; to insure development and execution of plans to provide full integrated logistic support prior to fielding; and to maintain a materiel readiness evaluation for monitoring the planned and achieved performance and support of the fielded system.

EARL T. GATLIN, THE CHIEF OF THE PROGRAM MANAGEMENT AND OPERATIONS DIVISION OF THE ASH PROJECT MANAGER'S OFFICE, DISCUSSES THE CHARTER, ORGANIZATION, AND MANY RESPONSIBILITIES OF THE ASH PMO.

The charter authorities proceed in logical and inclusive fashion from development through testing and field validation of the system and its **reliability, maintainability, and durability (RAM-D),** human factors and man-machine interfaces, resource control, and supportability.

Do the above words sound familiar? They should! Very similar language is contained in almost every weapon system charter.

My purpose in repeating this brief paraphrase of a typical major program charter is that many people in the weapon system development and acquisition management business tend to feel a charter is written for the project manager only. This is certainly not the case.

One of the most important segments of the charter is the annex which lists the participating organizations who are partners in a successful program. In order to achieve success in a program, the PM must have the full management and technical assistance of the participating organizations or his program is doomed to failure.

In this regard, the PM has an internal staff assigned for overall planning and management of his program. He must, however, also have full support of the functional managers within the developing

command to which the program is assigned.

Equally important, he must avail himself of the extensive talent and expertise that is available in the various laboratories, test agencies, logistics agencies, **Depot Systems Command (DESCOM),** the involved readiness commands and the user.

ASH PM Office Organization

Colonel Ivar W. Rundgren, Jr., assumed project management responsibility 15 October 1978. The current **Advanced Scout Helicopter (ASH)** Project Manager Office was later established and is assigned to Hq, AVRADCOM located in St. Louis, MO, along with the primary technical and logistical support base, i.e., AVRADCOM and U.S. Army **Troop Support and Aviation Materiel Readiness Command (TSARCOM).**

Due to the nature of the **Mast Mounted Sight (MMS)** technology and mission, both TSARCOM (Aircraft System) and the U.S. Army **Missile Command (MICOM)** (Target Acquisition/Designation) are the primary readiness commands.

The current ASH PM staff authorization is four officers and 33 civilian positions. This level of staffing is expected to increase slightly to a maximum staffing level of four officers and approximately 40 civilian spaces, based on known program objectives and requirements.

Areas that could influence required staffing levels are:

1) the integration of the **Multipurpose Lightweight Missile (MLM);**

(2) major **Rationalization, Standardization, Interoperability (RSI)** program involvement over and above current levels; and

(3) the extent of **Foreign Military Sales (FMS)** involvement of the AHIP System and support equipment.

Early in the program the Project Manager, with the support of Commander, AVRADCOM selected the

CULVER CITY, CALIF., Dec. 17—Hughes Helicopters, Inc. successfully flew for the first time its revolutionary helicopter design — the NOTAR® (No-Tail-Rotor) — at the Hughes Flight Test Facility at Palomar Airport in Carlsbad, Calif. The design uses a unique low-pressure air circulation system to replace a tail rotor. The test program will continue under and Army-DOD contract through 1982.

FT. RUCKER, AL, Dec. 10—BG Richard D. Kenyon, DCG of Fort Rucker, AL, is shown speaking to a gathering assembled to celebrate the 10th year of operation of the altitude chamber at the post's Hanchey Army Heliport. The post's first altitude chamber, which was put into operation on Dec. 9, 1971, is now housed in the Army Aviation Museum.

"CORE" PM staffing concept, to include maximum use of functional support from AVRADCOM, DARCOM Laboratories, and other participating orgnaizations. On his internal staff, the Project Manager implemented a military **Assistant Project Manager (APM)** concept.

The APM positions include an APM for Program/Requirements and an APM for Logistics. A Research and Development Coordinator position was established with a planned conversion to an APM for **Research, Development, Test and Evaluation (RDT&E)** as the program progresses through Full Scale Engineering Development into Development and Operational Testing and production readiness.

The civilian portion of the internal PM staff is organized in the CORE PM management concept with several unique organizational assignments to best manage the program and provide optimum resource control. The organization

consists of four Divisions as follows:

Technical Management Division. Responsible for technical management of mission equipment, the air vehicle, and total system integration. Current staffing in this Division consists of a Supervisory General Engineer, who supervises seven Aeronautical and Electronic Engineers.

A unique assignment

One of the aforementioned unique organizational assignments is an Operations Research Analyst within the Technical Management Division to perform required activities related to systems modeling and simulation, operational effectiveness, scheduling and risk assessment, and systems trade-off analysis to include both operational and support aspects of the AHIP.

In addition, the Research and Development Coordinator position is presently assigned to the Technical Management Division pending conversion to the APM, RDT&E.

Product Assurance/Test Division — Responsible for management of the product and quality assurance, configuration and test and evaluation programs for the AHIP system. Current staffing in this Division consists of a Supervisory General Engineer, two Aeronautical and Electronic Engineers, a Product Assurance Engineer and an Equipment Specialist.

The AHIP System configuration management functions are assigned to this Division, as are the Reliability, Maintainability, Durability, Quality Assurance and Test and Evaluation functions. An additional General Engineer will be added to this Division during FSED, prior to Development/Operational Testing and production readiness.

Logistics Management Division — Responsible for the integrated logistics management program for the AHIP program, to include the air vehicle, associated mission systems and support/test equipment. Current staffing in this Division consists of a Logistics Management Specialist, who presently directs the efforts of another Logistics Management Specialist and an Equipment Specialist.

This present limited staffing requires a very high level of support from the ILS organizations within AVRADCOM, TSARCOM, MICOM, and U.S. Army **Communications and Electronics Command (CECOM).** The staffing in this Division will be increased during late FY 82 and early FY 83 to provide additional Logistics Management Specialists.

Integrated management

Program Management and Operations Division — Organized in the "business management" concept wherein program/financial management and administrative support, operations research, systems cost analysis, and procurement and production functions are integrated into one Division.

Current staffing in this Division consists of a Supervisory Program Analysis Officer, an Operations Research Analyst, a Procurement and Production Officer, and Program and Budget Analysts. The Division is also staffed with an Administrative Officer, and a Visual Information Specialist.

The Procurement and Production Officer position in the PM internal staff is to provide maximum interface with the AVRADCOM Directorate for Procurement and Production, which provides the **Procuring Contracting Officer (PCO).** With the advent of FSED contact award, at least one Production Specialist position will need to be added to the PM Office.

In summary, the ASH PM Office is organized and staffed at the minimum essential level to perform the AHIP mission. The Project Manager and his staff are committed to the successful development, testing and fielding of the AHIP — they need your continued help and support.

AHIP - The Prime Contractor's View

SEPTEMBER 21, 1981 was an important day for both Army Aviation and Bell Helicopter Textron. For Army Aviation, the award of an AHIP contract was the high point of an 11-year effort to define and justify an aerial scout.

This fact is somewhat puzzling, because the AHIP mission is the oldest and best substantiated application of aircraft organic to the Army.

The mission originated in 1942 with the decision to make light aircraft organic to field artillery battalions as **aerial observation posts (Air OP's)** to facilitate target acquisition and the adjustment of fire. By combining the duties of air OP's and the classic scout mission of finding and reporting on enemy locations and intentions the requirement for an aerial scout has increased.

The introduction of an attack helicopter capable of rapid battlefield movement and the engagement of enemy armor has further expanded the need for an aerial scout with additional capabilities. Technology has evolved, which when integrated, provides an aerial vehicle with the capability to perform all three of the functions stated above.

THIS DETAILED OVERVIEW OF THE ARMY HELICOPTER IMPROVEMENT PROGRAM (AHIP) WAS PREPARED BY BELL HELICOPTER TEXTRON AND INCLUDED IN THIS AHIP SPECIAL ISSUE AT THE INVITATION OF THE ASH PROJECT MANAGER (ASH PM).

A parallel effort

Bell's pursuit of the scout program parallels the Army's effort to justify the need. Proposals and design configuration studies have been produced almost annually since the demise of the **New Initiatives Aerial Scout (NIAS)** program in 1971. For those who track these efforts, it's interesting to note that the basic requirement to provide a set of "eyes" for the scout has remained unchanged throughout the many iterations of NIAS, ASH, ISH, and finally AHIP.

This steadfastness of requirement was noted by Bell and became a key point in the design philosophy for the winning AHIP design, Bell's **Model 406.** A total system approach providing the best set of eyes possible for the scout crew, while not forgetting that this crew of two must now acquire, process, and disseminate more information from more sources than ever before.

For the **Model 406,** the **mission equipment package (MEP)** performance became all important for it must provide the crew the ability to find the enemy at max-

imum stand-off range, locate his position with the accuracy of a precision surveying instrument, then allow the crew to "hand-off" this accurate information to a unit with the capability to deliver ordnance on the target.

After receipt of the Army's **request for proposal (RFP),** Bell Helicopter immediately began a technology search, because it was obvious that the early required **initial operating capability (IOC)** would not allow any new developmental approach.

An industry-wide competition to select a **mast-mounted sight (MMS)** supplier was conducted with McDonnell Douglas Astronautics emerging as the winner. McDonnell Douglas' design was based on the **Internal Bearing Stabilized Sight Unit (IBSSU)** principle.

The exceptional stablization provided by this design insures that all sight performance parameters can be met with very low risk. Army tests of this concept over the past several years have shown that the stabilization provided is an order of magnitude better than any other method tested to date.

The increased stand-off range provided by the Model 406 AHIP equates to additional survivability for the scout crew. McDonnell Douglas selected Northrop Corporation to provide the TV, FLIR, and LASER plus the optics to tie these elements together.

Northrop will rely heavily on their experience in the TADS/PNVS competition held in the AAH program. Again, no new technology has to be developed for AHIP, the Bell team has only to repackage existing hardware.

While one part of Bell's AHIP proposal team was selecting a MMS supplier, another group was busy picking Sperry Flight Systems to provide the cockpit controls and displays which would allow the scout crew to accomplish their all-important tasks while still operating the helicopter safely. Sperry draws on recent experiences in USAF high performance aircraft for the fully integrated AHIP cockpit.

Meanwhile, Bell's senior engineers were busy gathering data from Army

FIGURE 1—THE SOFT-IN-PLANE, FLEX-BEAM 4-BLADED BELL-DESIGNED ROTOR WAS DEVELOPED ON THE BELL MODEL 206-LM.

studies, reports, and even previous visits to scout units to learn what unique aircraft design features were required for the scout mission. During this effort, all problems associated with the current scout, the OH-58A and C, were isolated so action could be taken to correct them. This effort provided valuable insight into the mystery of the scout pilot's perception of agility.

All the information and data gained was compared to capabilities of existing hardware, both military and civilian. Bell found that the OH-58 needed increases in three major areas to make it acceptable as the AHIP. They were **Power, Agility,** and **Tail Rotor Authority.**

To correct the **Power** problem, tests were run to determine the power required to perform critical maneuvers and what margins are necessary to keep the scout crew safe. Surprisingly to many people, the "Bob-down, stop, translate laterally" evasive maneuver required the most transient power. This power level became the Model 406 design point.

As you have already learned, 650 shp for takeoff or transient maneuvers is provided by the Allison T-63-C30 engine.

Agility is enhanced by the exceptional control response of a soft-in-plane, flex-beam 4-bladed rotor of Bell design. This type rotor was developed on the Model 206-LM (**Figure 1**) and many Army Aviators have had the opportunity to fly this aircraft. The rotor offers unparalled smoothness of ride as well as the control response of a rigid rotor.

FIGURE 2—THE AHIP MAIN ROTOR WILL BE A SCALED DOWN VERSION OF THE CIVIL CERTIFIED MODEL 412 ROTOR SHOWN ABOVE.

Maybe best of all, the rotor hub and the composite blades require no lubrication or daily maintenance. The AHIP rotor will be a scaled down version of the civil certified Model 412 rotor shown in **Figure 2.** This helicopter is in service and proving its value daily to commercial operators around the world.

A larger tail rotor system including a 110 hp 90° gearbox coupled to larger composite blades will provide precise handling in 35 knot winds from any direction. The pilot will be assisted with aircraft control by a three-axis **Stability Control**

JAMES F. ATKINS
PRESIDENT
BELL HELICOPTER TEXTRON

WALTER J. McCONNELL, PM, SPERRY FLIGHT SYSTEMS, DEFENSE SYSTEMS DIV.

CHARLES R. RUDNING
SENIOR VICE PRESIDENT, PROGRAMS

AHIP

The AHIP Team of Bell Helicopter Textron

CORRESPONDING ADDRESS:
BELL HELICOPTER TEXTRON
P.O. BOX 482
FORT WORTH, TEXAS 76101
(817) 280-2011

CHARLES MICHELSEN
SUB-SYSTEMS

J. LES SPENCER
TEST AND EVALUATION

JAMES CHILTON, PM, McDONNELL DOUGLAS ASTRONAUTICS COMPANY

LESTER M. WHITEIS ILS MANAGER

THEODORE L. HOFFMAN AHIP PROGRAM MANAGER

JAMES P. SCHWALBE DEPUTY PROGRAM DIRECTOR

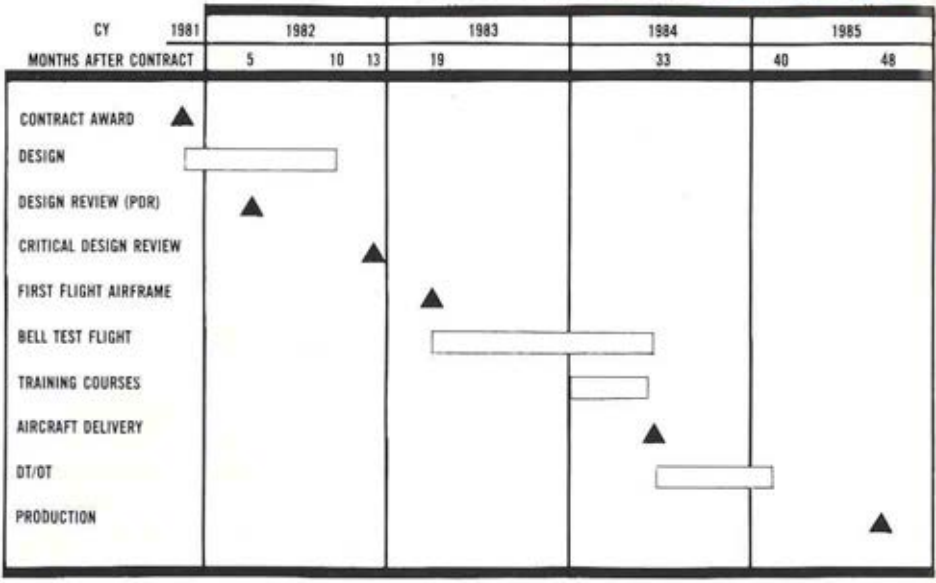
FRANKLIN D. HARRIS DIRECTOR, PROJECT ENGINEERING

JACK D. FLOYD DEPUTY PROJECT ENGINEER

BILL C. BOWEN HUMAN FACTORS

MICHAEL M. KAWA AIR VEHICLE

FIGURE 3—AHIP PROGRAM SCHEDULE



Augmentation System (SCAS) with heading hold.

Many ask, "Why a two-bladed tail rotor?" The answer is simple — **Survivability.** Two large blades will take tree strikes and bullet impacts and survive. AHIP survivability against projected threats will be further enhanced by the addition of the **Multi-Purpose Lightweight Missile (MLM).**

Space, weight, and power for this defensive installation have been included in the AHIP and all performance testing must be done with a simulated system installed. In other words, the AHIP mission gross weight includes the MLM.

All these components will be attached to an Army OH-58A airframe — but don't be concerned.

Static tests of the OH-58 fuselage and tail boom determined that the airframe could easily accommodate growth to 4,500 pounds, the AHIP maximum gross weight. The airframe under test withstood 225% of its design limit load with no failures.

First flight — April 1983

The AHIP program at Bell Helicopter has been and will be a team effort. The schedule shown in **Figure 3** will be met. First flight of the helicopter will occur in April of 1983 with first flight of a full-up system in November of 1983. Army DT/OT testing will begin with five prototype AHIP's in July, 1984 followed by production deliveries in November, 1985.

On the previous two pages we've shown you the Bell team members who are proud to be a part of the Army AHIP program. The program is designed to provide "New Eyes for the Army" and the real winner will be the scout crew who takes the Model 406 into combat. ■

by MAJ Charles M. Stancil

AHIP gets the nod of approval

The **Army Helicopter Improvement Program (AHIP)** is a success story in the checkered history of the U.S. Army's efforts to initiate a fully integrated scout helicopter development program.

As you may recall, the **Advanced Scout Helicopter (ASH)** program was reviewed by the Army in November 1979. Taking a realistic view of the future budget, the Army concluded that the ASH program was unaffordable. However, the need was confirmed and a near term modification program was deemed appropriate to address the near term requirement.

The **Office of the Secretary of Defense (OSD)** and the Congress had taken a similar view — new airframe development was too expensive and modification of an existing airframe was the way to proceed.

AHIP was first described to the Congress in the FY 81 Budget request. Congress reacted dramatically to the reorientation of the Army's scout program and increased the Army's RDT&E funding request by $20 million.

ABOUT THE AUTHOR

KEEPING DEPARTMENT OF THE ARMY STAFFERS "UP TO SPEED" ON THE ARMY HELICOPTER IMPROVEMENT PROGRAM IS THE RESPONSIBILITY OF MAJOR CHARLES L. STANCIL, DEPT. OF THE ARMY SYSTEM COORDINATOR.

Initial consideration of candidate airframes was directed toward the UH-1 and OH-58. Field trials conducted in early 1980 divulged the fact that the **Huey** was incompatible with the near term scout mission requirements.

The sheer size of the **Huey** detracted from its ability to fly the scout mission. It was more detectable to the threat than the OH-58, and it was a more difficult machine to fly in the scout mission profile. Therefore, the UH-1 **Huey** was eliminated from any consideration as an AHIP candidate.

A special 1980 ASARC

To insure that no feasible alternative program was overlooked, the Army convened a special ASARC in July 1980. The purpose of the July 1980 special ASARC was to decide the direction the program should take, given the fact that the smaller helicopters were better suited to the scout mission profile.

It was recognized that the Army had two airframes that could potentially fill this role — the OH-58 and OH-6. It was further recognized that the Army was facing the worldwide contingencies in the Middle East and Southeast Asia. Consequently, the decision makers agreed that whatever

FT. RUCKER, AL—Rear Admiral John G. Wissler, right, Cdr, Naval Air Test Center, Patuxent River, MD, and graduation guest speaker, talks with WO1 Thomas M. Shackfee, left, and CPT Larry H. Hysell, Distinguished Graduates of the WORWAC and ORWAC classes that completed nine months of training at USAAVNC on December 16.

HEIDELBERG, GERMANY—Four staff officers of the USAREUUR Aviation Office are shown receiving their advanced ratings. Shown L-R are Senior Army Aviator Badge recipients, LTCs Blair Blacker and Dieter Krause, and Master Aviator Badge Awardee, LTC Richey Hinton. COL Kirby Lawson, USAREUR Aviation Officer, (far right) pins Master Aviator wings on LTC Jerry Hipp.

airframe was selected, it must have the capability to perform its mission in a hot environment.

Therefore, the AHIP was reoriented to make it a competitive modification of an existing airframe with the requirement for the system to ultimately hover at the "hot day" condition of 4,000 feet pressure altitude, 95 degrees Fahrenheit.

The Program Manager proceeded to formulate his request for proposal based upon the guidance of the July 1980 ASARC. Meanwhile, at HQDA, actions were taken to program the funding necessary to make the AHIP an executable program in the FY 83-87 **Program Objective Memorandum (POM).**

The competition for funding, both RDT&E and Procurement, was intense. In the final analysis, AHIP remained high enough on the Army's priority list to emerge as a funding program. It's important to note that the FY 83-87 POM was formulated and submitted under the new administration's guidelines.

The new players in the OSD arena quickly began to make judgments on the materiel acquisition process. New policy was promulgated as AHIP was well into the source selection process. The most immediate impact of the new acquisition policy was elimination of the requirement for DSARC approval to award the full scale engineering development contract.

Under the new policy, the **Under Secretary of Defense for Research and Engineering (USDRE)** reviewed the Army's decision from the source selection process and approved program initiation/contract award; however, the USDRE decision carried a provision that a program go-ahead review by OSD would be conducted after preliminary design review.

A big decision point

The program go-ahead milestone replaces the former DSARC II/III milestones and is the last OSD formal review. The production decision **(Milestone III)** is now resident with the Army. Therefore, the next big decision point for AHIP is the OSD program go-ahead review. Of course, the USDRE retains the authority to convene a review if circumstances indicate an OSD review is required.

AHIP is unique. It is an outgrowth of a former program, ASH. It was "plushed up" by the Congress. It survived the intense competition for funding in the FY 83-87 POM. It was initiated under the new materiel acquisition policy. For the first time since the Army officially recognized a need for a fully integrated scout helicopter system, a program is approved and funded with the support of the Army, OSD, and the Congress. ■

Representing the User

(CONTINUED FROM PAGE 47)

Convoy Escort for Nuclear Weapons Convoys: When nuclear weapons are transported using ground convoys, the AHIP, with its extended visionics capabilities, is ideally suited for convoy escort and route reconnaissance. Using the MMS, the AHIP can reconnoiter terrain surrounding the route to ambush positions in sufficient time to alert or redirect the convoy. It can also assist the convoy in meeting its command, control communications and naviation requirements.

Traffic Control/Route Reconnaissance: During large scale unit moves, the AHIP can be used to find and classify suitable routes, eliminate traffic congestion, and direct units into positions, both day and night.

Rear Area Security: The mission equipment provided by the AHIP allows the commander to effectively employ it for rear area security. The AHIP can provide continuous surveillance between and around division and corps rear areas and can patrol major supply routes. When equipped with the air-to-air missile, the AHIP can effectively engage threat helicopters that are part of airmobile forces directed against the rear area, and the extended communications ranges of the AHIP radios provide the capability to immediately alert the controlling headquarters of the situation.

Special Operations: The navigational, communications, and target acquisition features of the AHIP can extend the commander's sphere of action during a variety of contingency situations throughout the world. The small size and design features of the AHIP will make it easily air transportable.

WESTPORT, CT—Although quite discernible as the front cover of this magazine, the photo isn't what you might think . . Pictured is an obvious December 1981 cover showing the UH-60A BLACK HAWK but is the snapshot one of a needlepoint pillow, or merely a slightly ragged beach towel with an aviation motif? . . It's neither. It was a culinary reproduction that drew many "Oooooh's" and "Ahhhhh's" before the Birthday Boy blew out the seven candles shown at the top, did his thing with the knife, and passed out the pieces of sugared Sikorsky.

The Road Ahead

The effort to get an improved aeroscout has been long and hard, and much still has to be done. The AHIP aeroscout represents the best efforts of many people dedicated to giving the scout crew a machine that enables them to see what they look for, report what they find, and kill what they shoot. Extensive testing and evaluation of prototype systems and the very favorable results of a comprehensive cost and operational effectiveness analysis give us a high degree of confidence that the AHIP will, indeed, contribute heavily to success in the airland battle. However, before it is fielded, the TRADOC community will work closely with the materiel developer to assure that it is properly supported and tested, and is ready for combat.

OBITUARIES

AHERN, JOHN ROBERT, 61, LTC (Ret.), died January 7 of cancer at Bethesda Naval Hospital. A WWII L-Pilot, he retired in 1966 with 23 years' service. He is survived by his wife, Vee, of Annandale, Va.; two sons, a daughter, his mother, and a sister. He was interred at Arlington National Cemetery with full military honors on January 11.

Since December 1963, the Foundation has provided 226 cash award scholarships totaling $71,700.

AAAA Scholarships and how they work!

THE some 10-14 scholarship awards being awarded to the sons and daughters of members or deceased members of AAAA on 12 February, I feel that many of our new Association members who are not familiar with this ongoing Ass'n program might like to know a bit more about the Scholarship Foundation itself, and perhaps several of the details of the unique selection process pursued by the AAAA.

It appears — at this mid-January point in time — that an applicant's 1982 chances of winning an AAAA cash scholarship award are one in eight (some 80 applicants for approximately 10-14 scholarships).

A word or two about the Foundation: The AAAA Scholarship Foundation, Inc., is a completely separate corporate entity administered by a 10-member Board of Governors.

The primary tasks of the Board of Governors are to establish the requirements for a workable scholarship assistance program, to make a broad determination of the annual dollar amount of total scholarship aid that is available in any particular year (and this is dependent upon donations received), to monitor the Foundation's investments, and to coordinate with the AAAA on the establishment and implementation of fund-raising programs.

In respect to fund-raising, the Foundation is a tax-exempt organization under the IRS Code, and donations, bequests, etc., are deductible from income and estate taxes.

The Foundation Board of Governors does NOT select the annual AAAA Scholarship winners. This task is performed by the AAAA National Award Committee, the same committee that selects the AAAA's National Awards Winners ("Aviator of the Year," etc.) each year. **Brigadier General Robert M. Leich, Ret.,** chairs this 18 member committee which meets each February to make its scholarship award selections.

An impartial selection

While the Governors recognize that several members of the AAAA National Awards Committee might know some of the parents of the scholarship applicants, and there's always the possibility they might be personally familiar with several of the applicants,the Governors feel that adequate steps have been taken to assure an impartial selection — one that would meet with your personal approval.

This is accomplished in the following manner:

- All applications for scholarship information, forms, etc., and all completed forms (personal, academic, interview, etc.) are submitted to one source, the AAAA National Office.
- The National Office censors all documents prior to their review by the members of the Awards Committee, the censoring consisting of the removal of the names of all applicants, parents, and AAAA interviewers, and the substitution of a distinct **file number** to identify all documents that are associated with a particular application.
- The members of the Awards Committee review the records of the applicant, then, **without** knowing the applicant's identity. The actual process is a bit more complicated, of course, but the fact remains that the committee members, in being unaware of the identify of the applicants, may judge and compare the academic and personal qualifications of all applicants, and do so without prejudice or conflict of interest.

Full list not disclosed

- Having worked with **file numbers** only, the Awards Committee does not know the names of the winners it selects, first learning these names **after** the selection of the last winner has been made.
- At this point, the Chairman requests a National Office representative to the open the sealed envelope, and to read the names of those applicants having the winning **file numbers.** The Committee is not shown the entire list of applicants at any time in the process, Foundation policy calling for the names of the non-winners to remain confidential.

I hope the foregoing has provided you with some insight into the process the Foundation pursues to assure an impartial selection of winners each year. Actually, the real problem is not one of guarding the identity of the competitors. An exceptionally large number of bright young men and women compete for these AAAA cash awards each year, and the real problem is **selecting** the winners.

DIRECTION

The AAAA Scholarship Foundation, Inc., a separate non-profit corporate entity, is administered by a ten-member Board of Governors that includes Bryce Wilson, a former National President of AAAA, as its President; MG John L. Klingenhagen, Ret., Vice President; Arthur H. Kesten, Secretary; COL Rudolph D. Descoteau, Treasurer; and the following retired officers as Governors: MG Delk M. Oden; BG Robert M. Leich; COLs Nelson A. Mahone, Jr. and John W. Marr; LTC Donald F. Luce; and Richard S. Steele. The Governors conduct their annual meeting during the course of the AAAA National Convention.

Suggestions are solicited

Your comments on all facets of this AAAA program — initial forms, selection, notification, etc. — are welcome. Many of the program's refinements were initiated through suggestions made by members, applicants, and parents.

It is a source of some satisfaction to the Governors and to the AAAA National Awards Committee that several divisional units and Army posts — in initiating their own scholarship award programs — have heard about the Association's selection process and have written to the AAAA for details.

Having given you this background just prior to the start of the '82 selection process, the Board of Governors believes that you're in a better position to appreciate the worthiness of this fine AAAA program.

Bryce Wilson
President, AAAA
Scholarship Foundation, Inc.

S. California members observe Columbia landing at Edwards

(CONTINUED FROM PAGE 13)

Support Facilities, responded to this mission, as well as the first shuttle landing in April, with a willing enthusiasm. Experienced crews, led by **Major Lance Fletcher** of Los Alamitos, required minimum practice or orientation prior to the landings.

Major Charles "Chip" Adam, a USAAEFA test pilot was the overall coordinator of Army and ARNG helicopter support and flew the TV/photo helicopter. **Major Mike Stratton,** also a USAAEFA test pilot, provided interface between USAAEFA, the USAF and DOD coordinators, and the ARNG on matters of shuttle security.

The next Space Shuttle mission is tentatively scheduled for March 1982. Another open house is planned and all AAAA members, families, and friends are invited to attend. A meeting notice flyer, which serves as a pass to gain access to AEFA on Edwards AFB, will be mailed to the **Southern California Chapter** AAAA members. Additional copies can be obtained by calling AV 350-3901 or (805) 277-3901.

Photo above: The US AEFA TV/radio retransmission UH-1H helicopter lands next to Columbia after the latter's landing at Edwards AFB on 14 November. The specially configured Huey provided NASA and the nation with the first close-up, "live" TV pictures of the shuttle after its roll out.

Aviation Center and Valley Chapters Lead AAAA

With three months of inter-Chapter competition remaining in AAAA's Six-Month Chapter Membership Enrollment Contest, the **Army Aviation Center Chapter** has a five-member lead over the **Indiantown Gap Chapter** in the **Largest Membership Gain** category. Prize? An All-Expense Paid Chapter Hospitality Suite on opening night at the 1982 AAAA National Convention.

In the **Largest Percentage Gain** category, the **Valley View (Germany) Chapter** is out in front of the **Indiantown Gap Chapter** by 63% to 41%. Here the prize is a sizable cash award. The **Top Ten Standings** appear below:

LARGEST MEMBERSHIP GAIN
(October 1981—January 1982)

#	THE GAINING CHAPTERS	1/1	±
1	Army Aviation Center	736	+47
2	Indiantown Gap	102	+42
3	Valley View Chapter	96	+37
4	Corpus Christi Texas	171	+21
4	Morning Calm (Seoul)	173	+21
5	Franconia-Marne	136	+19
6	Lindbergh (St. Louis)	388	+18
7	Fort Hood Chapter	208	+15
8	Mt. Rainier (Ft. Lewis)	168	+13
9	Mainz Chapter	59	+11
10	Bonn Area Chapter	89	+10

LARGEST PERCENTAGE GAIN
(October 1981—January 1982)

#	THE GAINING CHAPTERS	1/1	%
1	Valley View Chapter	96	63%
2	Indiantown Gap	102	41%
2	Cedar Rapids Chapter	34	26%
3	Mainz Chapter	59	23%
4	Fort Sill Chapter	70	22%
5	Franconia-Marne	136	16%
6	Corpus Christi Texas	171	14%
6	Morning Calm (Seoul)	173	14%
7	Bonn Area Chapter	89	13%
8	Monterey Bay (Ft. Ord)	98	9%
9	Fort Hood Chapter	208	8%
9	Mt. Rainier (Ft. Lewis)	168	8%
10	Army Aviation Center	736	7%
10	Birmingham Area	45	7%

DECEMBER 1981 CHANGES OF ADDRESS AND RESIDENCE AND MILITARY PCS (PERMANENT CHANGE OF STATION)

Takeoffs – PCS

Colonels

BROWN, John P.
4502 Sonata Court
Fairfax, VA 22032
FILER, Robert E.
6316 Rockwell Road
Burke, VA 22015
FREEMAN, Bobby H.
Kathmandu, Dept. Of State
Washington, DC 20520
MATTHEWS, Ralph A.
7810 Birnam Wood Drive
Mclean, VA 22102
McGLOCKTON, William H.
Quarters 21-2, SLASC
Granite City, IL 62040
STEWART, James T.
5055 Oak Bluff Drive
High Ridge, MO 63049

Lt. Colonels

BADGER, Bill D
R.D. 2, Box 4483
Jonestown, PA 17038
CHASTAIN, William M.
69th Transportation Bn
APO San Francisco 96460
CRAWFORD, George S.
532 Julie Lane
Brandon, FL 33511
FITE, Don G
3809 Keith Avenue
Fairfax, VA 22030
FLYNN, Timothy
WAARNG, Camp Murray
Tacoma, WA 98430
HARRIS, Franklin N.
HHC, V Corps DIO
APO New York 09079
HENRY, Edwin H
P.O. Box 774
Platte City, MO 64079
HERVEY, Albert E.jr
5242 Richardson
Fairfax, VA 22030
HORVATH, Leroy L
604 North 5th Street
Mascoutah, IL 62258
LANDERS, Curtis H
Hq, USARJ, G1
APO San Francisco 96343
LESTER, Rodney D.
13814 North Edison
Tampa, FL 33612
McDONALD, Robert C.
4401 N. Whittfield, Apt 132
Indianapolis, IN 46236
PRICE, Robert D.
201 Wild Oak Drive
Brandon, FL 33511
RAMAGE, Gary D.
PANDP, USA Elm, SHAPE
APO New York 09055
TURNER, William E.
HHD,.70th Trans Bn (AVIM)
APO New York 09028

Majors

ARENZ, James E
D Co, 8th Combat Avn Bn
APO New York 09185

Majors

BARRY, Charles L.
310 Hancock Street
Fort Leavenworth, KS 66027
BUTLER, Allen D.
Army ROTC Detachment
Auburn University, AL 36849
CLARK, Douglas M.
4953 Sioux
Sierra Vista, AZ 85635
DEVAULT, Steven E.
7806 Welch Court
Alexandria, VA 22310
FROST, Gary
949 Kristen
Derby, KS 67037
FUSON, Jack E.,jr
7754 Le Moyne Lane
Springfield, VA 22153
GANDY, Gregory K.
58 Endi Avenue
Fort Rucker, AL 36362
GLASS, Charles W.
2018 42nd Street
Columbus, GA 31904
GOLDSMITH, Lloyd E
8728 Old Montgomery Road
Savannah, GA 31406
GONSKI, Anthony J.
31 Megill Drive
Eatontown, NJ 07724
HEEHN, Richard C., HHC
4th TRANSCOM, Box 373
APO New York 09451
HOODENPYLE, James C.
5600 W. Bar X Street
Tucson, AZ 85713
IVEY, Ramon
Rt 1, Box 11, Mighty Oak Lane
Killeen, TX 76541
JONES, Gary W.
Box 607
Elgctra, TX 76360
JORGENSEN, Stephen P.
11308 Donneymoor Drive
Riverview, FL 33569
KEY, Carl E., Jr Box 3007
HHC, 7th Army Trng Cmd
APO New York 09114
KREUTZ, James R.
9519 71st Street, SW
Tacoma, WA 98498
McFARLAND, Thomas J.
Route 2, Box 150-C
Appling, GA 30802
McKAY, Eugene C.
15321 Eclipse Drive
Manassas, VA 22110
NASH, William L
5021 Seminary Rd, Apt 1508
Alexandria, VA 22311
RADWICK, Michael J.
1400 Graly Drive
Austin, TX 78758
RALLO, Joseph J.
HHC, 7th Army Tng Comd
APO New York 09114
REAMES, Joseph M.
803 Ben Fry Drive
Chester, VA 23831
REESE, Wesley D Box 4318
USA Hel TAFT-Kenya
APO New York 09675

Majors

ROGERS, Peter
Hq, Army Aviation Centre
Oakey Qld Australia 4401
SCRIVENER, Thomas S.
213 Hancock
Ft. Leavenworth, KS 66024
STIVER, Donald L.
405 Antler Drive
Enterprise, AL 36330
WYMAN, Samuel D.
106 Satinwood Court
St. Charles, MO 63301

Captains

BEST, Robert B.
9424 13-1/2 Street W.
Rock Island, IL 61201
BURTON, Thomas L
1346-B Werner Park
Fort Campbell, KY 42223
CAYTON, Leo B.
P.O. Box 4040
Fort Eustis, VA 23604
CHAMBERS, David L
1407 Hickory
Crossett, AR 71635
DYKES, Mark G
C Co, 501st Combat Avn Bn
APO New York 09140
GOTTLIEB, Norman
P.O. Box 112
Jolon, CA 93928
GREENLEE, George T.
Co F, 2d SB Sch Bde, USAICS
Fort Huachuca, AZ 85613
HARRIS, Stephen M
RR 4, The Woods
Elizabethtown, KY 42701
HILL, Chris L
P.O. Box 3423
APO New York 09114
HUTCHESON, Charles A
113 Stonewall Drive
Savannah, GA 31406
MADDEN, Gary E.
385-C Reasoner Road
Honolulu, HI 96819
McFARLIN, William
Sperry-5353 W. Bell Road
Glendale, AZ 85308
McMILLEN, Leroy B
2320 Wharton Court
Florissant, MO 63031
MITCHELL, Eric L.
Quarters X
Nas Patuxent River, MD 20670
OATES, James R.
HHT, 4/7th Cavalry
APO San Francisco 96251
OATES, Robert L.
A Co, 2d Aviation Bn
APO San Francisco 96224
OLIVER, Randall
6720 Doolittle Drive
Edwards AFB, CA 93523
PIERCE, John
289 W. William Street
Corning, NY 14830
QUALLS, Michael L.
408 Cottonwood Drive
Copperas Cove, TX 76522

Captains

RANDLE, Robert, II
HHC, 11th Aviation Bn
APO New York 09039
SLEDGE, Elton S., Jr.
719 Duncan Street
Wahiawa, HI 96786
SMITH, Roger N
9 Magnolia
Daleville, AL 36322
SPIDEL, David L
12409 Largo Dr, Apt 237
Savannah, GA 31406
WALKER, Paul C
Route 4, 33 Sunset Drive
Benton, AR 72015
ZAGORSKI, Donald R
P.O. Box 561
Fort Rucker, AL 36362

1st Lieutenants

ADKINS, Kenneth W.
143 Saratoga Road
Clarksville, TN 37040
BAKER, Daniel S
634 Grevillea Street
Ontario, CA 91761
CRISPIN, Robert R
US Army Safety Center
Fort Rucker, AL 36362
GRABLIN, Mark
114 Luke NBU 28Q
Fort Huachuca, AZ 85613
WILEY, Carl D.
2108-A Irwin Street
Fort Eustis, VA 23604

2d Lieutenants

HASTINGS, Thomas C.
C Troop, 4/7th Cavalry
APO San Francisco 96251
STEPHENS, Celeita
6915 Skyhawk Drive
Fayetteville, NC 28302

CW4's

GAGNE, Joseph R.
173rd Aviation Company
APO New York 09165
GORDYN, Rudolph J.
P.O. Box 32026
Aurora, CO 80012
GRIFFIN, Gerald L.
Box 415, 146th MI Bn- AE- P
APO San Francisco 96271

CW3'S

CHELGREN, David P.
2792-A Sacramento Court
Holloman AFB, NM 88330
DOTTERER, Jack H.
627 Paddy Run Road
Clarksville, TN 37040
EDMUNSON, John D.
537-C Dyea
Fort Richardson, AK 99505
HADLEY, James A.
1380 Paseo San Luis
Sierra Vista, AZ 85635

CW3'S

HARRIS, John M.
CMR 6, 14th Company, 1st Bn
Fort Rucker, AL 36362
KAUFMAN, Stuart M., Rm 201
Richardson BOQ, Bldg 1585
Fort Campbell, KY 42223
LORD, Emory S.
4770 Milgen Rd, Apt 3-C
Columbus, GA 31907
McGEE, Robert D.
1601 Boros Drive
Fayetteville, NC 28303
MURRELL, Reginald C.
B Troop, 4/7 Cavalry
APO San Francisco 96358
MYERS, Terry L.
13 Middlesex Road, Apt 11
Newport News, VA 23606
ROBICHAUX, John C.
Route 1, Box 254
Bell City, LA 70630
ROBINSON, Russel N.
C Co, 8th Combat Avn Bn
APO New York 09185

CW3'S

SCHURR, Robert J.
P.O. Box 152
Fort Campbell, KY 42223
SHOEMAKER, James
D Troop, 1/9 Cavalry
Fort Hood, TX 76544
STEFFEN, John J., PO Bx 5124
USAED-ELC-AVN
APO New York 09038
THOMPSON, Edward L.
C Co, 1st Combat Aviation Bn
Fort Riley, KS 66442
VICKERY, Donald B.
1806 Blankenship Drive
De Ridder, LA 70634

CW2'S

CANDELA, Frank M.
6905 W. Dobson
Niles, IL 60648
STROUD, Robert L.
3810-A Porter Loop
Wahiawa, HI 96786

WO's

LANDERMANN, Lawrence W.
42 Candlelight Drive
Danbury, CT 06810

ENLISTED

BARKER, Bobby G., SSG
1923 West 45th Street
Cleveland, OH 44102
DAVIS, Donald S., SGT
HHC, DUSAA, Box 6783
Fort Belvoir, VA 22060
HOLBROOK, Victor W., SP4
24025 24th Avenue South
Kent, WA 98031
MILLS, Sherry, SP4
CI/SIGSEC Spt Bn, 902nd MI
Fort Meade, MD 20755
ROSADO-BRUNO, Lucas, SGT
14775 Warwick Blvd, Apt 3-B
Newport News, VA 23602
STUTMAN, David, SSG
Route 1, Box 257
Anderson, MO 64831

ASSOCIATES

KNAPP, Lewis G.
320 Shore Road
Stratford, CT 06497
NOKES, Robert E.
10419 SW Gulfdale
San Antonio, TX 78216
SMITH, David O.
22257 Craggyview
Chatsworth, CA 91311

RETIRED

BOOTH, James W., COL
Box 45, Dependent Mail Sect
APO San Francisco 96301
BRITTON, Weldon C., LTC
12415 Ox Hill Road
Fairfax, VA 22033
DANIELSON, James D., MAJ
13209 Country Ridge Drive
Germantown, MD 20874
HENDERSON, John C., LTC
3810 Huntington Place
Dothan, AL 36303

Calendar

DECEMBER						
M	T	W	T	F	S	
				1	2	
4	5	6	7	8	9	
11	12	13	14	15	16	
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

APRIL						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

1981-1982 AAAA MEETINGS

■**DEC. 11.** Monmouth Chapter. Christmas Dinner-Dance. Fisherman's Wharf.

■**JAN. 19.** Delaware Valley Chapter. Professional Dinner Meeting. **Mr. Joseph P. Cribbins,** Special Assistant to DCSLOG, DA, and the Chief of the Aviation Logistics Office as guest speaker. The Towne House Restaurant located at South Avenue and Baltimore Pike.

■**JAN 19.** Washington, D.C. Chapter. Professional Dinner Meeting. **Dr. Robert S. Cooper,** Director, Defense Advanced Research Project Agency (DARPA) will speak on "The Role of DARPA in Advanced Technology Development". Fort McNair Officers' Club.

■**JAN 20.** David E. Condon Chapter. Professional Dinner Meeting. **BG Ellis D. Parker,** Deputy Director of Requirements and Army Aviation Officer, DA and a National Member-at-Large on the AAAA's National Executive Board as guest speaker. Fort Eustis Officers' Club.

■**JAN. 26.** Bonn Area Chapter. Professional-Social Membership Meeting. Hotel Forsthaus Heinemeyer in downtown Buekeburg.

■**DEC. 29.** Tennessee Valley Chapter. Professional Luncheon Meeting. **Mr. Joseph P. Cribbins,** Special Assistant to the DCSLOG, and Chief of the Aviation Logistics Office will speak on "Future Aviation Support Trends". Redstone Officers' Club.

■**DEC. 29.** Morning Calm Chapter. Professional-Social Meeting. A briefing team from MILPERCEN, DA will address "100 Series WO Personnel Management" and "SC 15 Officer Personnel Career Management". Hartell House Annex—Yong San.

■**FEB. 4.** Connecticut Chapter. Professional-Dinner Meeting. **BG Ellis D. Parker,** Deputy Director of Requirements and Army Aviation Officer, ODCSOPS, DA as guest speaker. Stratford Inn (formerly Stratford Motor Inn across the street from the Sikorsky Plant on N. Main Street, Stratford).

How did more than 12,000 Army Aviators share over $2 million during the past 23 years?

They received more than $2 million in flight pay claims under the AAAA-endorsed Flight Pay Insurance Plan (FPPP).

What are your flight pay insurance plan benefits if you are grounded?

Basic Plan

Provides you with TAX-FREE indemnity payments of 80% of your current flight pay, payable each month for up to 12 months if you become grounded for illness, an ordinary accident, or a military aviation accident caused by combat action . . and pays you up to 24 months if you are grounded for a military aviation accident not caused directly or indirectly by war or an act of war.

Added Benefit Plan

DOUBLES your standard 12 and 24 month indemnity payment periods for only about one-third more than the cost of the basic coverage.

If you choose the ADDED BENEFIT option, benefits are payable to you each month for up to 24 months if you are grounded for illness or ordinary accident or military aviation accident caused by combat action, and for up to 48 months for groundings caused by military aircraft accident not caused directly or indirectly by war or act of war.

This optional coverage, together with the plan's graduated premium scale, provides you with the maximum flight pay income protection during the years when your financial obligations are greatest.

Combat Coverage

This is all-risk combat protection against illness, wounds, an aircraft accident, or anything that's caused by a combat action with indemnities payable for up to 24 months.

Indemnities are tax-free

Your monthly indemnity checks - in the amount of 80% of your flight pay, are TAX FREE under Sec. 1.104 (d) (3) of the 1954 Internal Revenue Code. This means that your income checks are roughly equivalent to the TAXABLE flight pay income you'd normally receive from the government.

WHAT ARE THE FPPP DEATH BENEFITS?

Life Insurance

Monthly indemnity payments equal to 80% of your current flight pay will be paid to your beneficiary each month for the period shown below. The payment period is determined by your age at time of death.

Under 30	4 years
30 — 34	6 years
35 — 39	5 years
40 — 44	4 years
45 — 50	3 years
51 — 55	2 years

Exclusive Death Benefit

This death benefit — an exclusive feature of AAAA-endorsed Flight Pay Insurance — is paid to your beneficiary in the event of your natural or accidental death, except death sustained in a military aviation accident caused directly or indirectly by war or an act of war, or by hostile, police, or civil action or invasion, or resulting civil commotion or riots, or suicide, while sane or insane, within two years of effective date.

Premium Options

Premiums are payable annually, semi-annually, quarterly, or monthly by government allotment. If you select government allowment as your mode of payment, submit two month's premium along with your application. Contact your Finance Officer for Form DA 1341 to apply for the allotment.

Rates for AAAA-Endorsed Flight Pay Insurance

The Annual Premium Paid is based on a percentage of one's Annual Flight Pay

Age of Insured	Basic Protection Plan	Added Benefit Plan
Under 30	2½%	3¼%
Age 30 and Over	3½%	4¾%

Pre-Existing Illnesses

After 12 months of continuous coverage, the policy guarantees protection against groundings due to ANY AND ALL illnesses, even those pre-existing your first date of coverage, provided that your coverage is renewed from term to term without lapse.

Other facts about FPPP

All policies are dated on the first day of the month after the month in which the application is postmarked, and protection against grounding due to all accidents starts as of that date. Protection against grounding due to illness begins 30 days later.

Officer/Warrant Officer Flight Pay

Under 2 years	$125
Over 2 years	156
Over 3 years	188
Over 4 years	206
Over 6 years	400

Commissioned Officers

Over 18 years	$370
Over 20 years	340
Over 22 years	370
Over 24 & Under 25	280
Over 25*	250

*If an O-6 or under and in an operational flying job.

EXCLUSIONS

The insurance under the program shall not cover any loss to any Insured Person resulting in whole, in part from, or due to any of the following:

1. Criminal act of the Insured, or from injury occasioned or occurring while in a state of insanity, temporary or otherwise.

2. "Fear of flying," as officially certified by responsible head of the Insured's Service in accordance with ap-

plicable regulations.

3. Anxiety neuroses, mental or nervous disorders, dizzy spells, or loss of consciousness that are not accompanied by any organic symptoms or ailments.

4. Alcohol, drugs, venereal disease, arrest or confinement.

5. Disability caused by intentional self-injury, attempted suicide, or criminal assault committed by the Insured, or fighting, except in self-defense.

6. Failure to meet flying proficiency standards as established by the Insured's Service, unless caused by or aggravated by or attributed to physical disqualification, including sickness or accidental bodily injury.

7. Inability of the Insured to meet the physical standards for Hazardous Flight Duty because of a revision in those standards, rather than because of disease or accidental bodily injury causing a change in the physical condition of the Insured.

8. Voluntary removal or suspension from Hazardous Flight Duty

9. Willful violation of flying regulations resulting in suspension from flying, as a punitive measure, or as adjudged by responsible authority of the Insured's Service.

10. Sentence to dismissal from the Service by a general court martial, submitted resignation for the good of the Service, or suspension from flight duty for administrative reasons not due to disease or accidental bodily injury.

11. An accident while riding, flying, or driving in any kind of a race.

12. Primary duty requiring parachute jumping.

13. Due to accidental bodily injury sustained before the effective date of an Insured's coverage under the program.

14. Caused by illness or disease which arose or was contracted before or within 30 days after the effective date of an Insured's coverage under the program, or a recurrence of such disability, whether or not a waiver has been authorized by appropriate medical authority in accordance with regulations or directives of the Service concerned, unless the Insured has been covered for twelve consecutive months immediately prior to the date disability commenced.

FPPP PREMIUM TABLE INSUREDS UNDER AGE 30

AAAA-Endorsed Life Insurance/Flight Pay Protection Plan

If Monthly Flight Pay	Your Annual Flight Pay	Your Annual Prem. Rate	Your Semi-Annual Prem.	Your Quarterly Prem.	Your Gov't Allot. Prem.
$125	$1,500	$37.50	$19.75	$10.38	$3.38
Added	Benefit	$48.75	$25.38	$13.19	$4.31
$156	$1,872	$46.80	$24.40	$12.70	$4.15
Added	Benefit	$60.84	$31.42	$16.21	$5.32
$188	$2,256	$56.40	$29.20	$15.10	$4.95
Added	Benefit	$73.32	$37.66	$19.33	$6.36
$206	$2,472	$61.80	$31.90	$16.45	$5.40
Added	Benefit	$80.34	$41.17	$21.09	$6.95
$400	$4,800	$120.00	$61.00	$31.00	$10.25
Added	Benefit	$156.00	$79.00	$40.00	$13.25

FPPP PREMIUM TABLE FOR AGE 30 AND OVER

AAAA-Endorsed Life Insurance/Flight Pay Protection Plan

$156	$1,872	$60.84	$31.42	$16.21	$5.32
Added	Benefit	$88.92	$45.46	$23.23	$7.66
$188	$2,256	$73.32	$37.66	$19.33	$6.36
Added	Benefit	$107.16	$86.08	$27.79	$9.18
$206	$2,472	$86.52	$44.26	$22.63	$7.46
Added	Benefit	$117.42	$59.71	$30.36	$10.04
$250	$3,000	$105.00	$53.50	$27.25	$9.00
Added	Benefit	$142.50	$77.25	$36.53	$12.13
$280	$3,360	$117.60	$59.80	$30.40	$10.05
Added	Benefit	$159.60	$80.80	$40.90	$13.55
$310	$3,720	$130.20	$66.10	$33.55	$11.10
Added	Benefit	$176.70	$89.35	$45.18	$14.98
$340	$4,080	$142.80	$72.40	$36.70	$12.15
Added	Benefit	$193.80	$97.90	$49.45	$16.40
$370	$4,440	$155.40	$78.70	$39.85	13.20
Added	Benefit	$210.90	$106.45	$53.73	$17.83
$400	$4,800	$168.00	$85.00	$43.00	$14.25
Added	Benefit	$228.00	$115.00	$58.00	$19.25

APPLICATION FOR FLIGHT PAY PROTECTION PLAN COVERAGE
Ladd Agency, Inc., 1 Crestwood Road, Westport, Conn. 06880

Rank/Grade Name ASN Yrs Svc for Pay

Address

City State ZIP Date of Birth

I have enclosed a check or money order made payable to LADD AGENCY, INC. for the correct premium and understand that coverage under the FPPP is to become effective on the first day of the month after the month in which I make application for the coverage.

I certify that I am currently on flying status in an Active U.S. Army or ARNG USAR unit, am entitled to receive incentive pay, and that to the best of my knowledge I am in good health and that no action is pending to remove me from flying status for failure to meet the required physical standards of the service.

Signature Date

NOTE: This coverage is only made available to AAAA members. I am a current member of the AAAA.
I am not a current member of the AAAA but have enclosed my $15.00 initial year AAAA Dues.

Annual Flight Pay Premium Mode

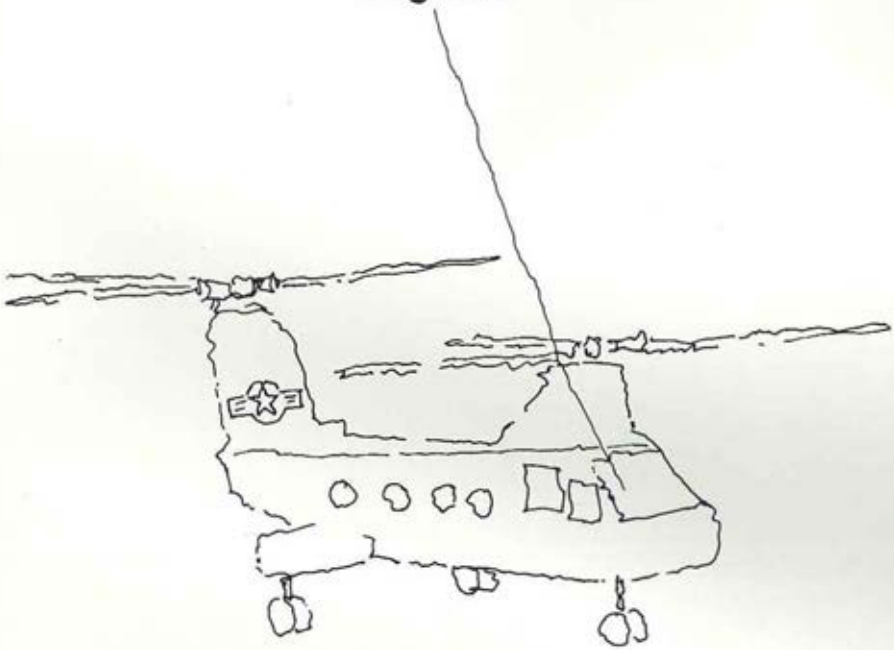
Beneficiary

Relationship to Insured

HERE'S HOW TO TO OBTAIN COVERAGE

1. Complete the application form in its entirety, selecting your premium payment mode. Consult the premium table to determine your appropriate premium.
2. Make your check or money order payable to LADD AGENCY in the amount of the correct premium.
3. Mail your check and this application form to LADD AGENCY, 1 Crestwood Road, Westport, Conn. 06880.
4. Allow 2-3 weeks for the delivery of your individual policy of insurance.
5. Consider that your FPPP coverage begins on the first day of the month after the postmark month in which you make application for the coverage.

King who?



King Radio, the company with new ways of looking at things. Quite simply, we put existing technology to uses no one else has even thought of.

Like EAROM, electronically alterable read only memory. It's an idea that's been pretty much confined to computer design. But King was the first to see its advantages in avionics. The result: non-volatile avionics displays that require no battery power.

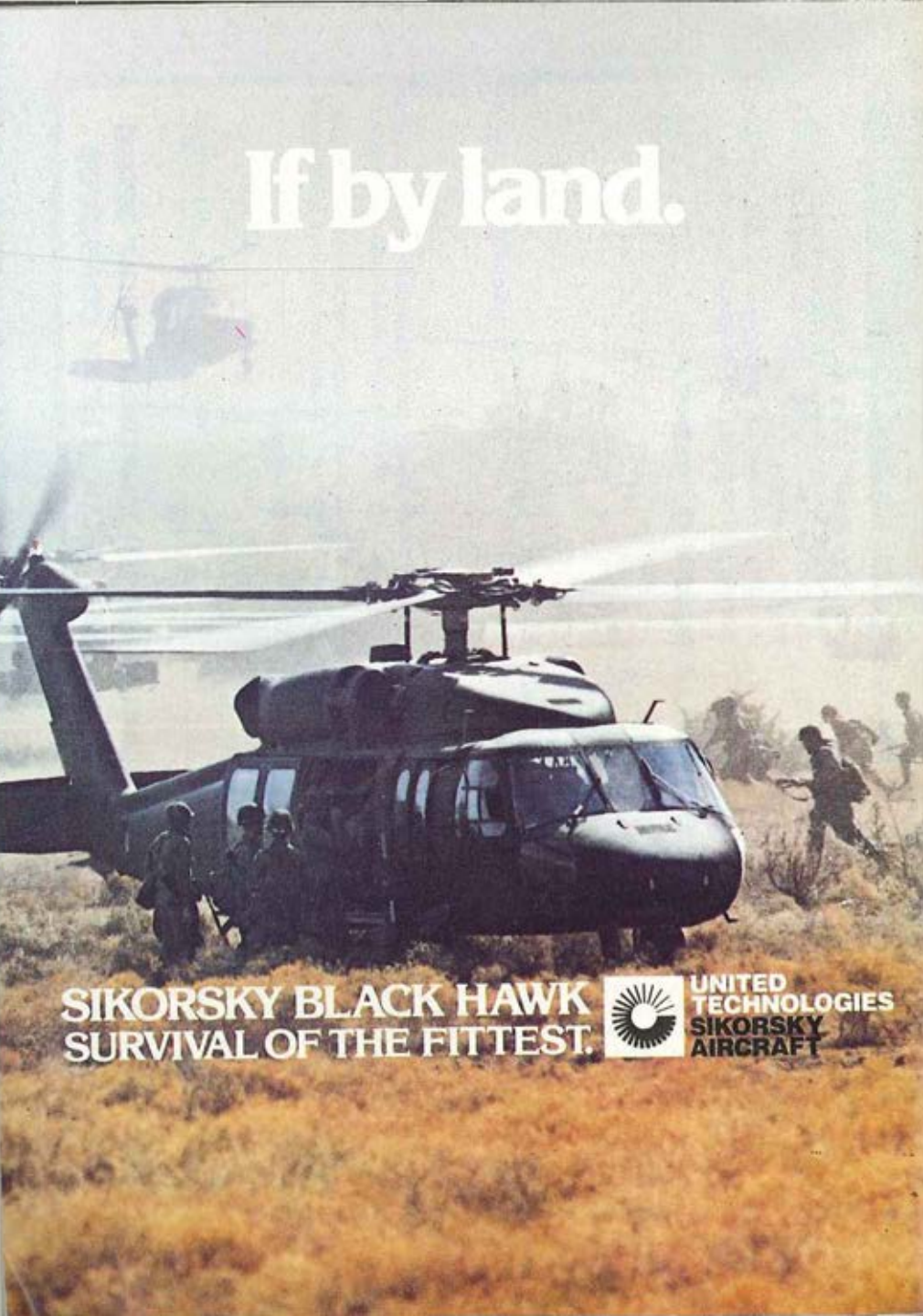
And it was King's creative use of custom large scale integration (LSI) technology that produced a 7 pound TACAN for a Navy target drone.

Or an airborne HF/SSB transceiver with 280,000 channels (99 preset) that weighs only 19 pounds; or an integrated navigational system that combines TACAN, VOR, Localizer, Glideslope and RNAV with 10-waypoint capability all into a unit measuring only two inches high.

Ask us what we can do for your program. We'll give you some ideas that no one else may have even considered. Write Dan Rodgers, Director, Special Programs Department, King Radio Corporation, 400 North Rogers Road, Olathe, Kansas 66062. Or call (800) 255-6243. TELEX: WUD (0) 4-2299.

You won't have to ask twice.

KING


If by land.
SIKORSKY BLACK HAWK
SURVIVAL OF THE FITTEST.
UNITED
TECHNOLOGIES
SIKORSKY
AIRCRAFT