Army Aviation

AUG./SEPT., 1977

The Army's AAH . . . A Total System for Battle

The Hughes YAH-64

Army Aviation

AUGUST-SEPT., 1977

AAAA NATIONAL AWARD WINNERS

CW2 Randy F. Dyer, Ft. Ord, 'Aviator of Year'
SP5 Charles W. Ball, Parkersburg, W. Va., WVA-ARNG, 'Aviation Soldier of Year'
MAJ Arthur H. Mountcastle, Ft. Campbell KY McClellan Aviation Safety Award Winner
7th Squadron, 17th Cavalry, Ft. Hood, 'Outstanding Aviation Unit of Year.'
300th Aviation Co [USAR], Grand Prairie TX 'Outstanding Res. Comp. Aviation Unit

CITATION

The U.S. Army Aviation Research & Development Command (ACRADCOM) has notified the Boeing Vertol Company that it has been awarded a superior performance rating for design-to-cost accomplishments for the CH-47 modernization program during 4 June 1976 and 30 June 1977. In recognition of this superior rating, Boeing Vertol will receive 91% of the award fee available for the first award fee period of the CH-47 modernization contract. The amount of the award is $271,800. □

DONATION

The U.S. Army Aviation Engineering Flight Activity (USAAEFA) at Edwards AFB, CA, received the **1977 Grover E. Bell Award** at the AHS Annual Forum for outstanding engineering flight test achievement during the UTTAS and AAH Government Competitive Testing. **COL Dennis M. Boyle,** USAAEFA Cdr, cited that "the award included a $250 honorarium which the members of USAAEFA wish to donate to the **William R. Horton-Michael Hawley** Memorial Scholarship Fund. **LTC Horton** and **CPT Hawley,** as members of the activity, contributed significantly to the successful conduct of the UTTAS Program." □

AAAA CALENDAR

AUG. 24. David E. Condon Chapter. AAAA Beer Bust. Dogs, burgers & beer. $1 head. Fort Eustis Rod & Gun Club.

AUG. 25. Corpus Christi TX Chapter. Late afternoon prof'l metting. **Sergi I. Sikorsky,** guest speaker. Sunroom.

SEPT. 4. Conn. Chapter. Sixth Annual Summer Skirmish. 7-course Brunch. Art & Dotty Kesten's home. Members only.

SEPT. 22. Avn Center Chapter. Prof'l dinner meeting. **Sergei I. Sikorsky,** guest speaker. Ft. Rucker O-Club.

SEPT. 24. Chicago Area Chapter. Family Outing at Cubs-Pirates game. Bus, game tix, beer, 8 ea. Fr O'Hara O-Club.

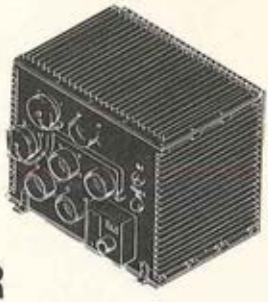
●●●●●

ARMY AVIATION. Second Class Postage Paid at Westport, Connecticut. □

AWARD—MG Pat W. Crizer (cen.), Cdr, 3d Inf Div, presented A Co, 3d Avn Bn (Cbt) with the VII Corps Plaque and DA Award of Honor for three years and 15,000 hours of accident-free flight. Commanded by **MAJ Eugene W. Cole,** A Company has since accumulated 16,555 hours and four years of safe flight during July 73 - June 77. □

TELEDYNE SYSTEMS COMPANY

A Hughes
AAH Team
Member



FIRE CONTROL COMPUTER FOR U. S. ARMY YAH-64

FEATURES

- Weapon System Pointing and Stabilization
- Gun Fire Control
- Ranging and Target Designation
- Target Dynamics Prediction

TELEDYNE
SYSTEMS COMPANY 19601 Nordhoff St., Northridge, Ca. 91324 (213) 886-2211

Plan to attend the 1977 AAAA National Convention in Arlington, at Stouffer's National Center Hotel during 14-16 October

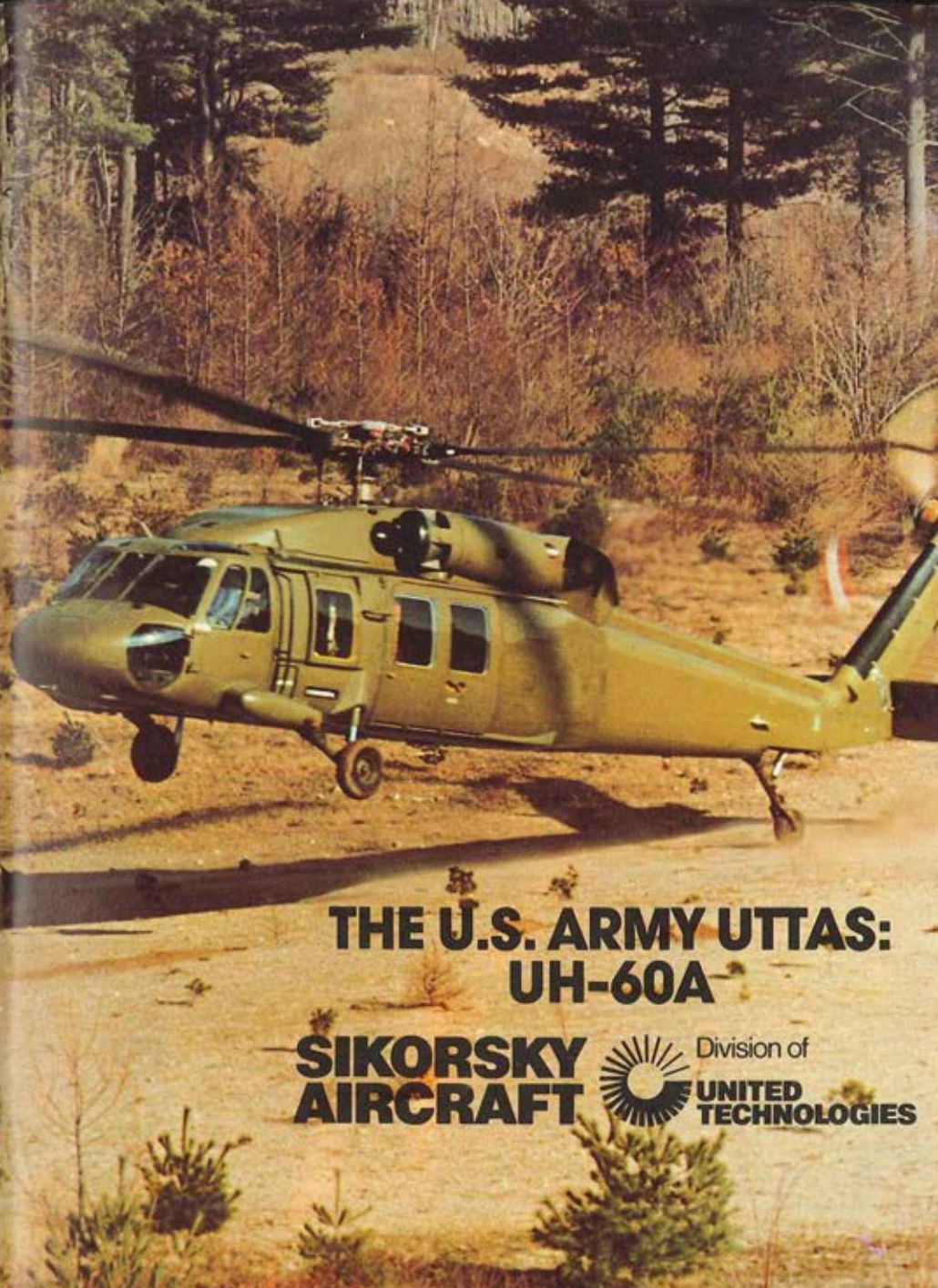
Friday, 14 Oct. Business-Social Program

1200-1800 Registration and Ticket Sales, Charleston Room.
0900-1200 AAAA Nat'l Board Meeting. Decatur Room.
1400-1600 Chapter Affairs Meeting. Chapter Officers, Delegates, and Members. Decatur Room.
1700-1800 1977 Cub Club Reunion. President's Suite.
1800-2100 Early Birds' Reception. Farragut Room.

Saturday, 15 Oct. Prof'l-Social Program

0800-0805 Welcome and Introduction by Lt. Gen. Robert R. Williams, USA [Ret.], President, AAAA.
0805-0840 DA Army Aviation Officer Report by Brig. Gen. Charles E. Canedy, Army Aviation Officer, DA.
0840-0900 Break for refreshments.
0900-1000 Sovetskiye Vertolyety i Prinadlezhaschiye Sistemy Vooruzheniya.
1000-1030 "The Importance of Iranian Military in Protecting the Persian Gulf" by Maj. Gen. Manoochehr Khosrowdad.
1030-1130 "Increased Survivability and Decreased Detectability for Future Helicopters." A comprehensive report by four selected industrial representatives.
1130-1400 1977 AAAA General Membership Luncheon. Recognition of Outgoing Members and Outstanding Chapters.
1400-1630 'How Can the U.S. Army Respond to the Challenge? A Panel Session with Lt. Gen. Robert M. Shoemaker, Deputy Commander, FORSCOM, as the Panel Moderator. Panelists include Maj. Gen. James C. Smith [USAAVNC]; Maj. Gen. Manoochehr Khosrowdad [IIAA]; Brig. General Charles E. Canedy [DA]; Brig. General Story C. Stevens [AVRADCOM]; Brig. General John W. Woodmansee [TRADCOM]; and Brig. General Benjamin E. Doty [MILPERCEN].

[Continued on Page 8]



THE U.S. ARMY UTTAS: UH-60A

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Officers establish membership in USAA by taking out a policy while on active duty, while a member of the Reserve or National Guard or when a Retired Officer (with or without retirement pay). OCS/OTS/Advanced ROTC also may apply.

Saturday, 15 October Program

1630-1635 Closing Remarks by the Panel Moderator and the Presentations Committee Chairman, AAAA.
1900-2000 1977 AAAA Honors Luncheon Reception.
2000-0100 1977 AAAA Honors Dinner-Dance. Formal. Presentation of AAAA National Awards.

Sunday, 16 Oct. Social Program

1030-1100 Nat'l Executive Board Meeting. President's Suite.
1100-1300 The Diehards' Brunch. A "Bunch Munch" and run.

Advance Registration Form

RETURN TO: AAAA, 1 Crestwood Road, Westport, Connecticut 06880

FUNCTION	Active Delegate	Civilian Delegate	Military Member	Civilian Member	Non-Member
Registration [All AAAA Professional Sessions]	$5.00	$11.00	$8.00	$16.00	$25.00
Saturday, 15 October, 0930-1100 Ladies' Coffee, Presidential Suite	No charge	No charge	No charge	No charge	No charge
Saturday, 15 October, 1130-1400 AAAA General Membership Luncheon	$7.00	$12.00	$12.00	$16.00	$20.00
Saturday, 15 October AAAA Honors Reception, 1900 Hours, and Honors Dinner-Dance, 2000	$11.00	$23.00	$22.00	$32.00	$40.00
Sunday, 16 October, 1100-1400 1977 Diehards' Reception and Getaway Brunch	$5.00	$8.00	7.00	$11.00	$15.00
Total Payment	$29.00	$55.00	$49.00	$75.00	$100.00

[Note: '77 Member and Delegate Fee totals are less than '76 totals for the same number of functions.]

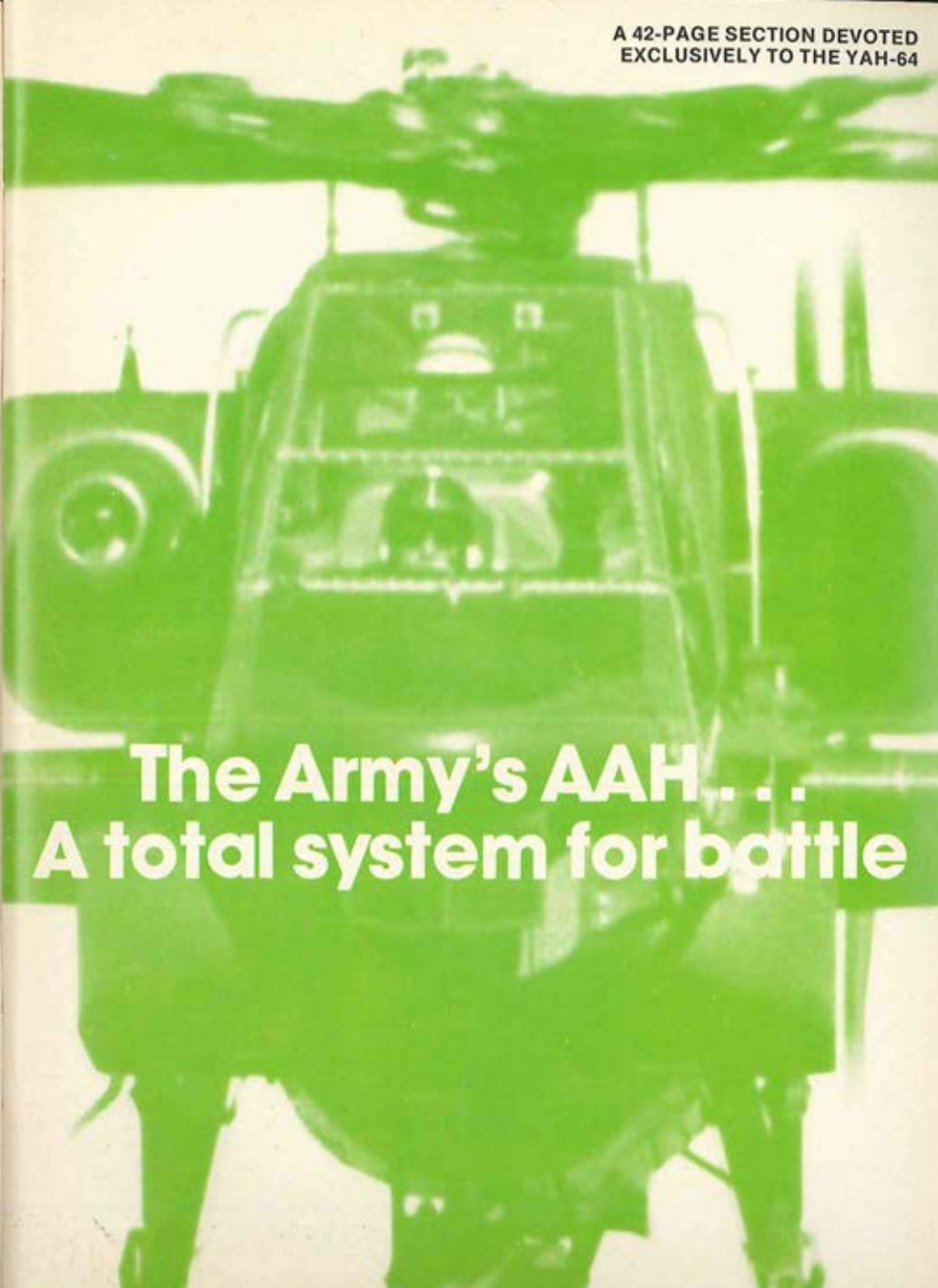
Name.....Rank/Grade.....

Unit or Firm.....

Address.....

City.....State.....ZIP.....

A 42-PAGE SECTION DEVOTED EXCLUSIVELY TO THE YAH-64



The Army's AAH. . . A total system for battle

UNITED STATES ARMY
THE CHIEF OF STAFF

U.S. Army operations in Vietnam coupled with subsequent field tests have confirmed the value of the attack helicopter as a unique and essential fire support system--immediately available and responsive to the needs of the ground commander. It is abundantly clear that this airborne weapons platform will be an invaluable asset on any future battlefield and add another dimension to our combined arms team.

The Advanced Attack Helicopter development program will yield the aircraft which will provide our Army this new and important capability. The AAH, with its capability to operate and survive in the forward battle area, will play a key role especially in anti-armor engagements and offer our commanders a means of quickly concentrating combat power at decisive points in minimum time.

The Army looks forward to the AAH joining our front-line forces with the certainty that it will make a major contribution to our ability to fight outnumbered--and win.

BERNARD W. ROGERS
General, U.S. Army
Chief of Staff

By COLONEL [P] EDWARD M. BROWNE
AAH Project Manager
Hq, AVRADCOM, St. Louis, Mo.

The AAH Program

The AAH is a TEAM player!

I WANT everyone in the Army to know what the Advanced Attack Helicopter Program is all about and to share my enthusiam for getting this superb aerial tank killer into the hands of the troops — sonnest!

In that regard our sincere thanks go to Art Kesten, the editor, for dedicating virtually a complete issue of **"Army Aviation"** to the Army's No. 1 aviation program.

First and foremost, the AAH is a **team player** — a lethal member of the combined arms team. Bringing major weapons systems through development also requires a concerted team effort, and I cannot speak too highly of the tremendous support given me in managing this program by the Chief and his staff, and the Commanders of DARCOM, TRADOC, and United States Army, Europe.

Elements of each of these commands have joined me to bring you this composite overview of the AAH Program from the materiel development scenario through the development of training and tactics for its employment.

Background

In June 1973, the Deputy Secretary of Defense authorized the Army to initiate a two-phase development of the **Advanced Attack Helicopter**, Phase I to be a competitive development for selecting the best helicopter airframe to enter Phase II full scale engineering development.

Phase II will focus on completing subsystems (missile, canon, rocket, target

The Hughes YAH-64

Above: The Bell YAH-3 proposal

acquisition and night vision) develop systems(missle, cannon, rocket, target acquisition and night vision) development and their integration into the winning helicopter.

During July 1973, Bell Helicopter Company and Hughes Helicopters were awarded contracts to design and fabricate a static test article, a **Ground Test Vehicle,** and two flying prototypes to be evaluated in the competitive fly-off.

The Bell Helicopter candidate, a two-bladed tricycle-gear aircraft with pilot located in front, was designated the YAH-63 and the Hughes Helicopters candidate, a four-bladed, 3 point-gear system with pilot in rear seat, the YAH-64. Both aircraft use twin T-700 General Electric turbine engines rated at 1,560 SHP each.

Following first flight of the prototypes in September 1975, both companies conducted extensive developer tests of their aircraft before delivering them to the Army for Government competitive tests at Edwards Air Force Base, California.

Military developer test pilots and operational pilots from user commands participated in the evaluation of the helicopters. The Source Selection results were presented to the Secretary of the Army on 10 December 1976. He selected the Hughes YAH-64 as the winner.

The full scale engineering development program will encompass approximately 60 months. It will include the fabrication of three additional flying prototypes, the development and integration of a target acquisition-designation system, a pilot's night vision system, and the fire control essential to integrate the anti-tank and area weapons subsystems.

System Description

The AAH is a twin engine (1,560 SHP T-700 engines) helicopter with four bladed, fully articulated main and tail rotors, and three point gear with the pilot in the rear of a tandem cockpit.

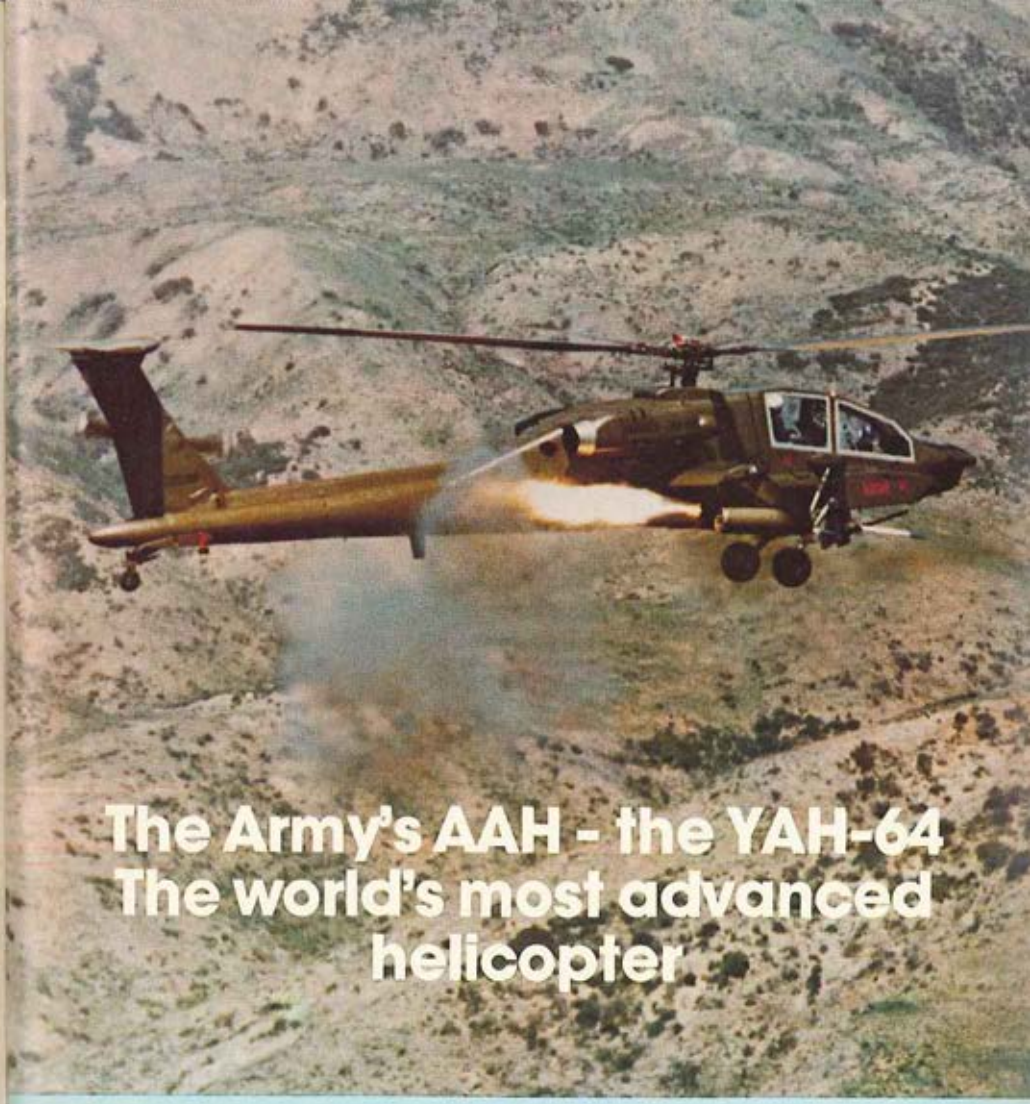
The YAH-64 AAH is the first Army Attack Helicopter to be developed specifically for the day, night, adverse weather anti-armor mission with emphasis on the ability to fight, survive, and live with the troops in the "Front Line" battlefield environment.

Phase 1 Priorities

To achieve this objective, emphasis was placed on designing in the following prioritized characteristics:

Flight Performance. The best measures of performance for a helicopter, at a prescribed atmosphere, mission weight, and endurance, are vertical rate of climb (VROC), cruise speed, and agile maneuverability (the ability to avoid obstacles at high speed).

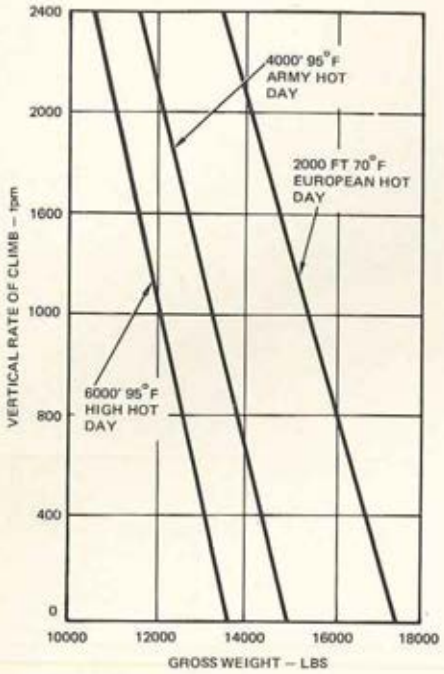
The charts on **Page 14** present the flight performance while carrying sufficient fuel for 1.83 hours' endurance.



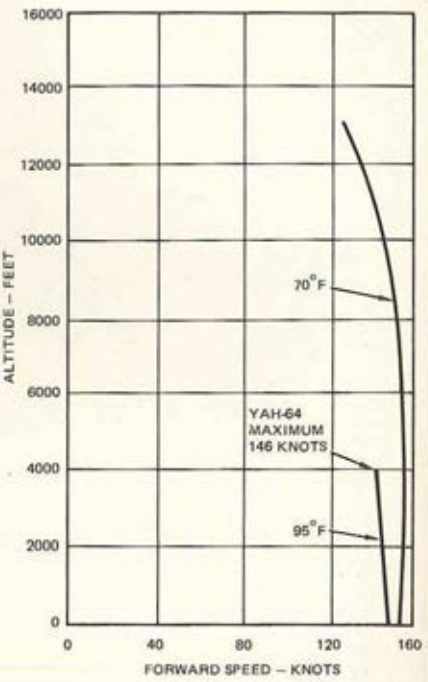
Hughes Helicopters

A Division of Summa Corporation

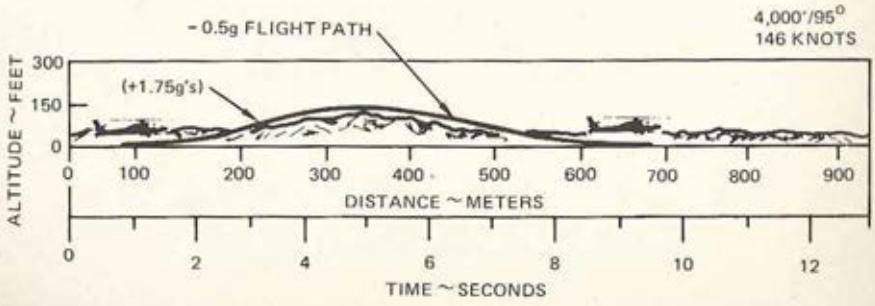
VERTICAL RATE OF CLIMB



CRUISE SPEED



AGILITY



AAH Program

All of our design efforts have been focused to culminate in making the AAH a superb tank killer. The primary weapon is the HELLFIRE anti-tank missle (See A below). Its lethality against tanks at long stand-off ranges has been demonstrated repeatedly in the direct and indirect fire modes throughout the separate missile development program.

The area suppression weapons are — first — the old standby 2.75-in. rockets (see **B**), of which the AAH carries 76 in four 19-shot pods, and the new 30mm "chain gun" cannon (see **C**, opposite page) developed by Hughes specifically for the AAH. The AAH will carry 1,200 rounds of 30mm high explosive dual purpose ammunition (HEDP).

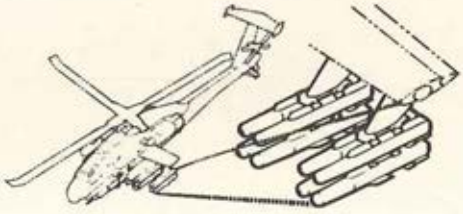
These outstanding weapons have been coupled through a new fire control system that now provides excellent accuracy of all weapons for air-to-ground engagements, and we have included, for the future, provisions for an air-to-air engagement capability. All armament systems can be operated by both the co-pilot and/or the pilot through the use of the integrated helmet and display sight system (IHADSS) (see **D**, opposite page).

New ADEN-DEFA ammo

On 29 September 1976, OSD directed the AAH Project Manager to develop a new 30mm ADEN/DEFA class of ammunition for the Army's Advanced Attack Helicopter that could also be used in the USMC's Harrier, and is interoperable in the ADEN and DEFA guns of our NATO allies.

Currently, 30mm ADEN/DEFA ammunition is used in many NATO and third country aircraft. Basically three automatic cannons: the British MK IV ADEN gun, the French 552 and 553 DEFA guns fire this standard ammunition. Over 14 combinations of 30mm weapon systems and aircraft (from the

POINT TARGET SUBSYSTEM



16 HELLFIRE MISSILES
BUILT-IN TEST AFTER LOADING

Hellfire Weapon Subsystem

76 FFAR Rockets
Weapon/Stores Management

2.75 ROCKET SUBSYSTEM

Mirage III to the Gnat F Mark I) are deployed in active forces in most of the Free World.

Our task is to assure interoperability of this new ammunition in these systems.

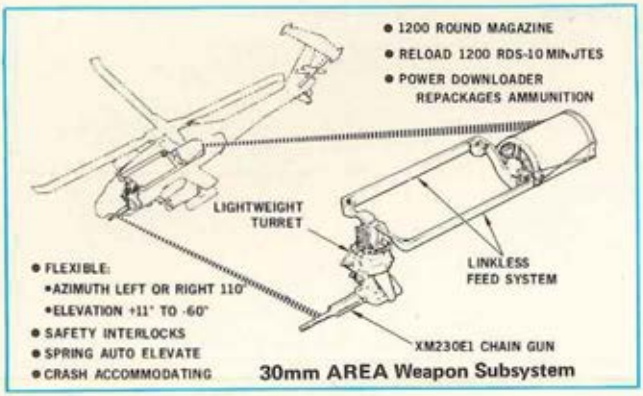
The AAH-developed 30mm ammunition will be a new high explosive dual purpose (HEDP) round, having both anti-personnel fragmentation features and excellent penetration against lightly armored vehicles. Hughes was awarded a contract on 2 March 1977 for the development of the US ADEN/DEFA ammunition.

The characteristics of this ammunition are listed in the adjoining table:

Cartridge Characteristics

Cartridge Weight	3.54 kg (approx)
Case Material	Aluminum
Projectile Weight	.240 kg (approx)
Muzzle Velocity	760 m/s to 800 m/s
Peak Pressure	290 MPa
Impulse	260 N.s.
Cartridge Length	200mm
Cartridge XM788	TP
Cartridge XM789	HEDP

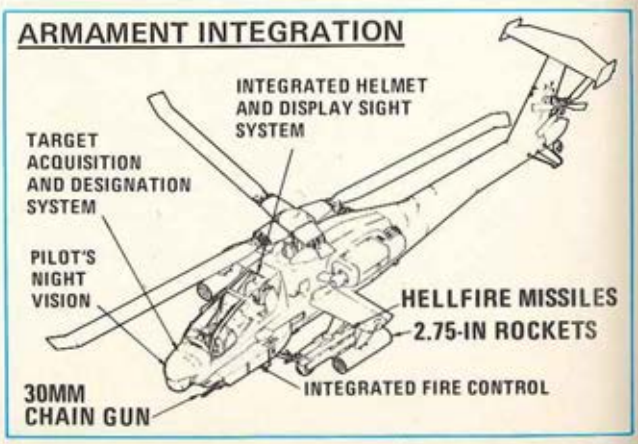
Because of the capability and rapid development of the 30mm ADEN/DEFA configured HEDP cartridge, it is also being evaluated for additional applications to include the U.S. Army's AH-1S **Cobra**, the **Armored Cavalry Cannon Vehicle** [**ACCV**], and the Marines' AV-8B **Harrier** and its **LVTP-7** landing craft.



30mm AREA Weapon Subsystem

Armament Payload

Varying altitude conditions and temperature will dictate finite mission loads. However, the AAH requirement is a minimum 450 feet per minute vertical rate of



climb with eight HELLFIRE missiles and 320 rounds of 30mm with 1.83 hours' endurance at the Army hot day (95°, 4,000 feet, 95% IRP). The YAH-64 will exceed that minimum. The following chart depicts several representative options.

AAH ARMAMENT OPTIONS = MISSION FLEXIBILITY

MISSION				PERFORMANCE VROC	V CRUISE	ENDURANCE
ANTI-ARMOR (DEFENSE) MID-EAST PRIMARY MISSION 4000'/95°F	4 HF	320 RDS	4 HF	700 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE 2000'/70°F	8 HF	1200 RDS	8 HF	600 FPM	146 KTS	2.5 HRS
COVERING FORCE (AIR CAV) MID-EAST ALTERNATE 4000'/95°F	4 HF	777 RDS	4 HF	450 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE 2000'/70°F	4 HF 19 RKTS	1148 RDS	4 HF 19 RKTS	450 FPM	146 KTS	2.5 HRS
AIRMOBILE ESCORT MID-EAST ALTERNATE (4000'/95°F)	19 RKTS	416 RDS	19 RKTS	450 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE (2000'/70°F)	38 RKTS	788 RDS	38 RKTS	450 FPM	146 KTS	2.5 HRS

Survivability

I believe survivability on the modern battlefield is directly related to three elements:

- 1. the inherent ballistic "toughness" incorporated into the basic design of the airframe.
- 2. the optimization of weapons lethality and fire control during integration, and
- 3. the tactics developed for employment.

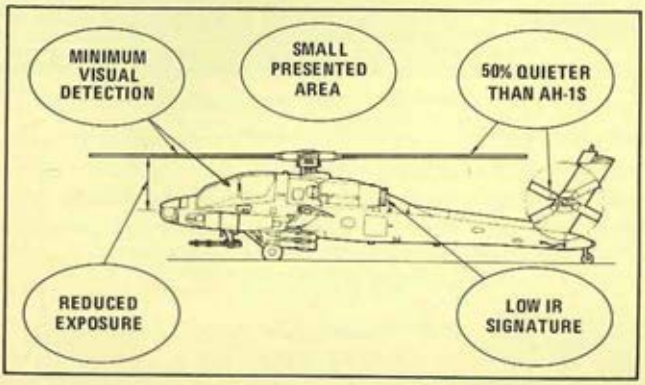
We have already discussed the weaponry and its integration, and **"Bo" Maddox** and **"Doc" Bahnsen** will, in separate discussions in this issue, walk you through the tactics for employment, so let's now focus on the survivability features designed into the AAH.

Low Detectability. A low flicker rotor, low glint canopy, composite materials, "scissor" tail rotor, overall compact design, and a new approach to engine plume suppression have resulted in a low signature across the aural, visual, radar, and infrared spectrums. [**See chart at the lower left.**]

Ballistic Tolerance. The vulnerability assessment of the YAH-64 indicates an invulnerability to 12.7mm fires and low vulnerability to 23mm HEI. Added features, such as the reqirement for the main gearbox to operate one hour without oil, further enhance mission accomplishment.

New metals and materials used in the AAH have resulted in the ability to take multiple hits of 12.7mm and 23mm HEI and still fly home. Protection of the crew is provided against a lone 23mm HEI getting both the pilot and the co-pilot, and a Kevlar blast shield [**see the opposite page**] below the seat arrangement protects the pelvic area.

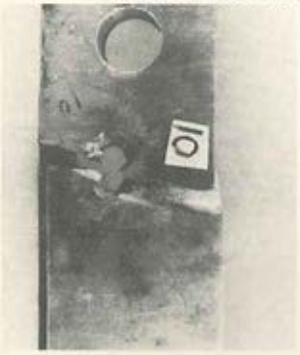
The main rotor blades, which incorporate five overlapping — but independent — spars, can withstand a worse case of 23mm HEI hit and still let you fly home.



The fuel cell system and structure has demonstrated taking a 23mm HEI hit without exploding or catching fire, and the tank self-sealed! Now that's what I call **ballistic toughness!**

Crashworthy. Rugged construction and innovative design features maximize low system attrition. Additionally, 95% probability of crew survival at a crash impact rate of 42 feet per second is engineered into the YAH-64. Our goal — save the crew and repair the helicopter so both will fight again. In sum, the AAH is the most survivable helicopter known. Its survivability is achieved by a synergistic aggregation of high maneuverability, a rugged twin engine airframe highly tolerant of 23mm HEI and invulnerable to 12.7 mm rounds. Redundant flight control systems, seal-sealing fuel cells — all make the AAH an exceedingly "hard" helicopter. □

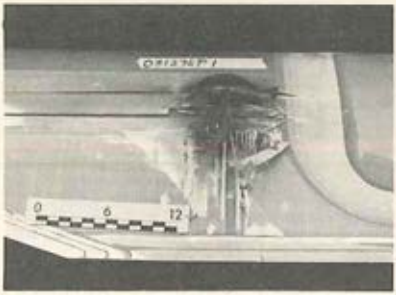
CRITICAL COMPONENT MATERIALS



Typical Aluminum Part

Advanced Aluminum Alloy in AAH

23MM HEI CREW PROTECTION BLAST SHIELDS



MAIN ROTOR SPAR HIT – 23MM HEI
Operated 5.2 Hours After Hit – No Failure

Transparent Shield Between Cockpits

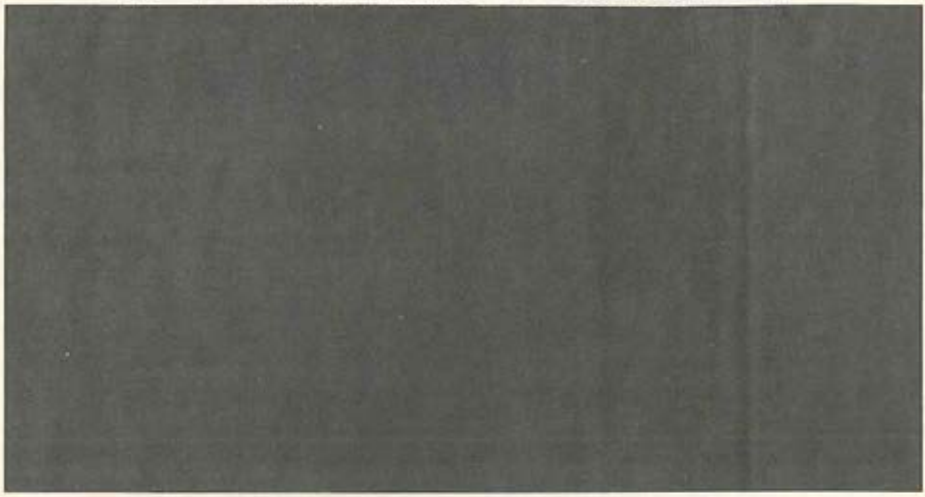
Below Seat Shield

PROJECT MANAGER'S COMMENTS

The **Target Acquisition Designation System [TADS]** and the **Pilot's Night Vision System [PNVS]** with fire control integration make up the heart of the AAH. These new additions to our heliborne attack capability are what enable us to find, fix, and kill targets in adverse weather, both day and night.

In the following article, **Colonel "Bud" Patnode**, the Project Manager for TADS/PNVS, tells us about these super systems.

HOW MANY HOSTILE TANKS ARE IN THIS PICTURE?



The ability to answer that question could mean the difference between victory and defeat. With the Warsaw Pact's numerical superiority in tanks—more than 2-1/2 to 1 by most reliable estimates—and with its emphasis on night training, it is essential that NATO have a capability for detecting and identifying armored vehicles at stand-off ranges during daylight and at night.

For the U.S. Army Advanced Attack Helicopter (AAH), Martin Marietta is developing a completely passive day/night Target Acquisition and Designation System (TADS) that functions at zero light level even in rain, snow, or smoke where other systems fail. Working in conjunction with the Pilot Night-Vision System (PNVS), these two systems enable AAH crews to maneuver and acquire targets. Once acquired, targets can be tracked manually or automatically for autonomous attack with AAH guns, rockets, or Hellfire missiles. The laser designator in TADS may also be used to designate targets for remote attack by other AAHs with Hellfire or by artillery units firing the laser-guided projectile, Copperhead.

How many hostile tanks are in that picture? The AAH crew will know.

MARTIN MARIETTA

By COL. CLARENCE A. PATNODE, JR.
Project Manager, TADS/PNVS
AVRADCOM, St. Louis, MO.

TADS/PNVS

A new dimension in attack capability

TO quote the attack helicopter crew that has just returned from a night search and destroy mission, "There has got to be better way." Well there is, and it is coming in the form of two major AAH subsystems.

These two independently functioning subsystems, the **Target Acquisition Designation System** and the **Pilot Night Vision System**, more commonly known as **TADS/PNVS**, will provide the crew of the AAH with the advanced hardware necessary to accurately search out, detect, recognize, and engage enemy targets at standoff ranges during day, night, and in adverse weather conditions.

Pessimists please read on

Let's pause here for a moment to digest that statement because it says a mouthful. For the optimist in the group, with the exception of telling you when you will have this hardware, you have probably heard enough.

However, for those of you who tend to be pessimistic, this really sounds like Buck Rogers' stuff, doesn't it? Well, what that statement really means is that you as a crew member of an AAH will be able to enter a relatively unknown area in day or night and be capable of quickly and accurately searching out and — destroying enemy targets while operating in among the trees, NOE, and beyond the range of your primary threat weapons.

Still not convinced? Well, you are right; there is more here than meets the eye, but think back for a moment to what technology has done for you.

From eyeball power to the TOW sight unit has been a big improvement in targeting range and accuracy. The **TADS** is a turret mounted electro-optical system designed to extend the range and accuracy at which the **Copilot/Gunner [CPG]** of an AAH can detect, recognize, and engage enemy targets.

The **TADS** incorporates various sensors to provide, during periods of limited visibility, a day and night target acquisition capability. The primary day sensors of this system include a high resolution television and a telescopic system indentified as **Direct View Optics [DVO]**.

Thermal imaging

For night operations the **TADS** incorporates a thermal imaging system known as a common module **Forward Looking Infrared [FLIR]**. Although the **TADS FLIR** is the primary sensor for night target acquisition, it also augments day capabilities of the **TV** and **DVO**.

The **FLIR** is capable of locating and automatically tracking targets through smoke, haze, dust, and other conditions

when the target would not otherwise be visible through the **TV** and **DVO**. These different sensors provide the appropriate capabilities and fields-of-view to enhance target acquisition and may be used singly or in combination, depending upon the weather, visibility, and the tactical situation.

A laser rangefinder

Target designation for laser guided munitions delivery is provided by a **Laser Rangefinder Designation**, known as **LRF/D**. Not to be confused with a destructive laser, the purpose of the **TADS** laser is to place a laser energy spot on a target for laser guided munitions to seek. The **TADS LRF/D** provides several key functions for the AAH:

(1) target designation for autonomous delivery of the HELLFIRE missile;

(2) target designation for remote attack by other AAH's with HELLFIRE, or artillery units with Copperhead, and other service laser guided munitions;

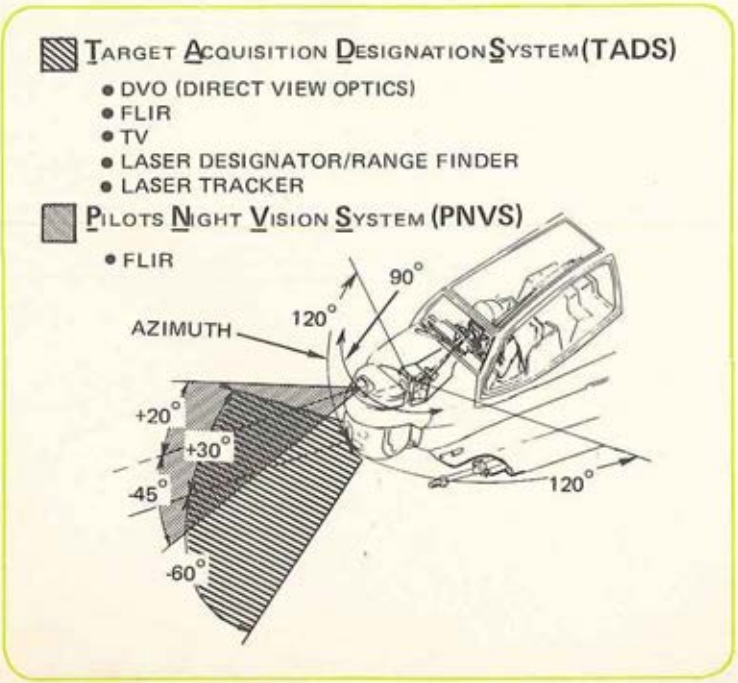
(3) accurate target ranging for employment of AAH guns or rockets; and

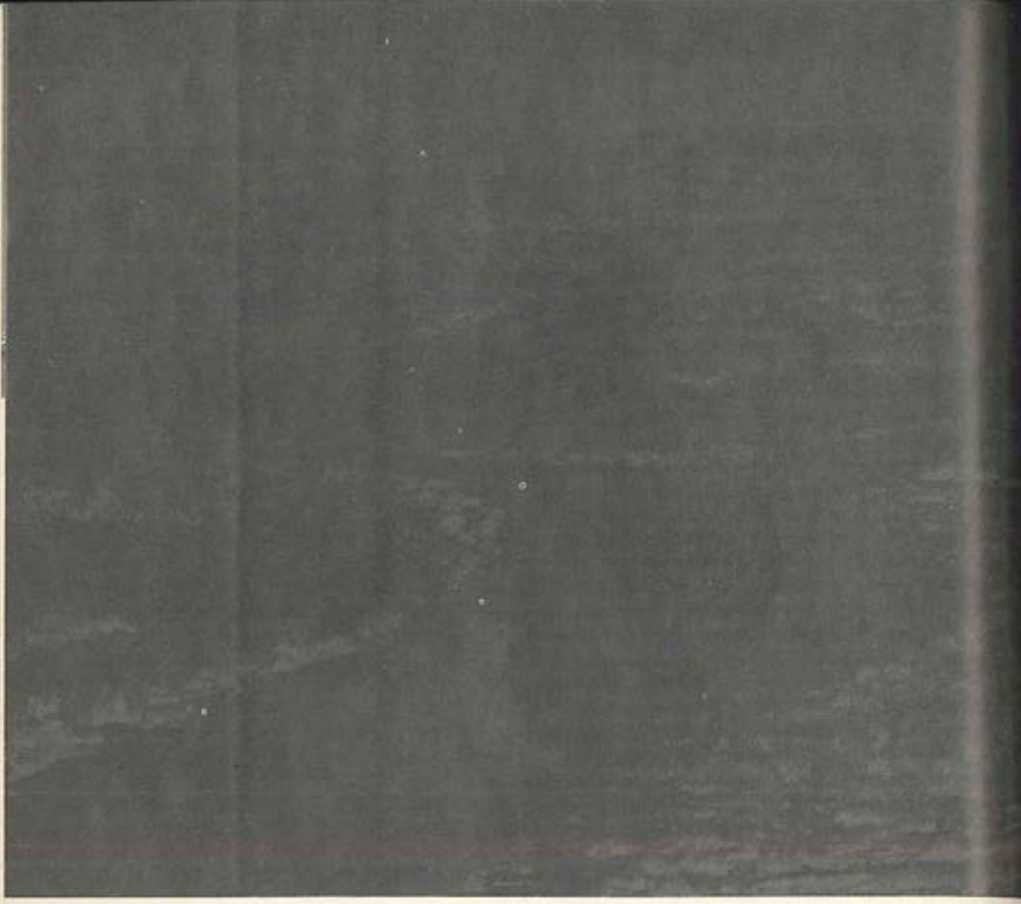
(4) accurate updating of the AAH lightweight Doppler navigation system.

The **TADS** also incorporates an automatic tracker which provides automatic target tracking through the **FLIR** and **TV**, and a laser spot tracker which will enable the **CPG** to automatically acquire targets being designated by other laser designation systems.

The **TADS** controls and displays located in the forward crew station enable the **CPG** to select from the varying capabilities of the **TADS** components to optimize target acquisition and engagement.

The **PNVS** is a turret mounted wide field-of-view **FLIR** system, similar to the **TADS FLIR**, which will provide the pilot of the AAH with a night operational



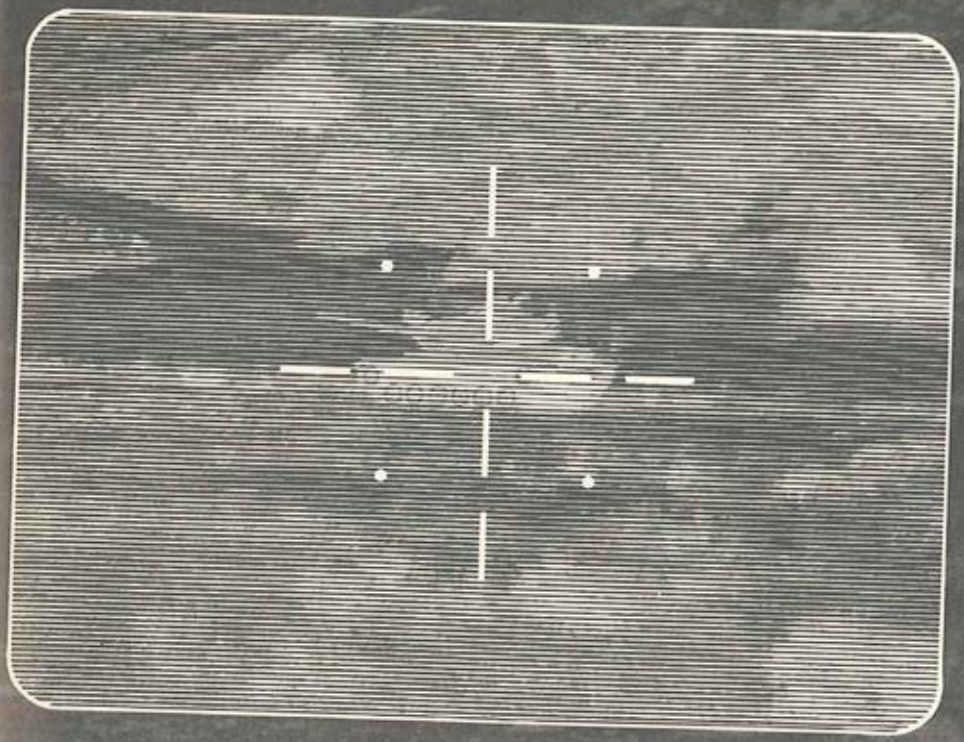


AAH: ATTACK

Northrop's long-range visionics enable U.S. Army Advanced Attack Helicopter (AAH) to attack and survive. Northrop's Target Acquisition Designation System (TADS) and Pilot Night Vision System (PNVS) permit AAH to operate at extended standoff ranges, day or night, under adverse weather conditions.

TADS/PNVS permits nap-of-the-earth flight, target acquisition beyond visual range, laser tracking and precision laser designation for Hellfire missiles and other guided weapons, fire control for rockets and gun. (Cockpit display information simulated for

*TISEO—Target Identification System Electro Optical. SPAL—Stabilized Platform Airborne Laser. ISTAR—Improved Scout Target Acquisition Recognition. LOHTADS—Light Observation Helicopter Target Acquisition Designation System. LATAR—Laser Airborne Target Acquisition Recognition. LTDS—Laser Target Designator Set.



AND SURVIVE

security purposes in photo above.)

Army AAH requirements for direct view, day TV, day/night forward looking infrared, laser tracker, laser rangefinder, laser designator and stabilized platform have been successfully demonstrated in previous Northrop systems.*

In five years of producing electro-optical systems for tactical aircraft and helicopters, Northrop has met all commitments for cost, schedule and system performance.

Aircraft, Electronics, Communications, Construction, Services.

Northrop Corporation, 1800 Century Park East,
Los Angeles, California 90067 U.S.A.

NORTHROP

DDR&E VISITOR

COL [P] Ed Browne, the AAH PM [2d from left], is shown briefing Dr. William J. Perry [3d from left] on the TADS/PNVS of the YAH-64. Accompanying Dr. Perry were Hughes Helicopters' executives John Kerr [far left], AAH Program Director, and Thomas R. Stuelpnagel, Vice President & General Manager.

TADS/PNVS

capability encompassing various airspeeds and altitudes, to include all NOE operations. As with the **TADS FLIR**, the **PNVS FLIR** will provide a night or day capability for aircraft maneuvering and operation during periods of reduced visibility such as blowing sand, dust, smoke, and haze.

FLIR imagery is observed by the pilot on a helmet mounted display, better known as the **Integrated Helmet and Display Sighting System [IHADSS]**, which keys **PNVS** turret movements to the movement of the pilot's helmet through the use of electro-magnetic sensors.

Given these capabilities, yes, there is a 'better way' to conduct a night search and destroy mission.

During the next fifty-three months the **TADS/PNVS** will undergo extensive bench and flight testing in conjunction with the Phase II development of the AAH, to ensure that when the **AAH/TADS/PNVS** is delivered to the user it will indeed provide a unique target acquisition day/night combat capability.

PROJECT MANAGER'S COMMENTS

There are many other areas of major significance in the Army's Advanced Attack Helicopter Program. **Reliable Available Maintenance [RAM]** is one of them. **Major General "Jim" Smith**, the Aviation Center Commander, covers the "training" aspects of AAH maintenance support elsewhere in this issue. In the next section we discuss **RAM**, as well as the **Avionics** and **Cockpit Arrangements** in both the pilot and co-pilot/gunner's compartments. I've asked the editor to enlarge my rather small "Cockpit Arrangement" charts so that you may be able to get a better feel for the ultimate cockpit displays in the AAH.

The many other areas of interest, Maintenance, Avionics, Cockpit Arrangement, Program Schedule, etc. are covered by Colonel Browne

Other AAH Aspects

Reliable Available Maintenance: A must!

Much attention has been given to **RAM** during design. The results elicited the following comment from the SSEB operational suitability area chief, "The most outstanding helicopter I have seen, in my career, for meeting the NOE mission and ease of maintenance in the forward battle area."

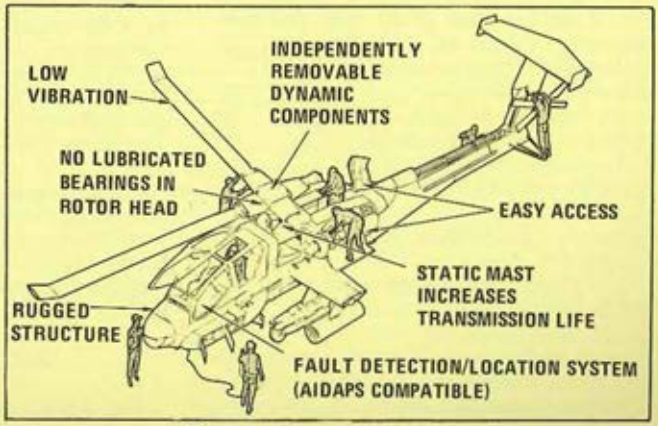
Among other firsts in helicopter new design innovations is the ability to remove the **main gear box [MGB]** without first taking off the blades and the rotor hub. The rotating mast is cranked down, thus engaging its splines from the rotor hub and the **MGB** is slid out sideways.

We have already demonstrated the **MGB** removal, replacement, and return to flight within two hours. We feel quite confident that the RAM features of the AAH will result in higher availability for combat missions than our present day helicopters.

Avionics/Cockpit Arrangement. The cockpit of the AAH is quite full of "goodies," but all-in-all is less confining than the **Cobra.** Standard lightweight avionics, VHF-UHF-FM secure commo links, and a lightweight Doppler navigation system are provided.

To further aid navigation during night NOE, I have proposed to DA the incorporation of a projected map display to do away with the juggling associated with trying to read a hand-held map under trying conditions. The pilot's and co-pilot gunner's panels are laid out exceptionally well for the attack mission. **[See charts of the next pages.]**

Tape type instruments and overall panel/console arrangements have been designed to keep crew workload to a minimum.



PROGRAM SCHEDULE

The Phase II program on the AAH is a 60-month full scale engineering development wherein two Hughes helicopters from Phase I will be modified to the latest configuration. Three more of the helicopters will be built, and the development of HELLFIRE, 30mm cannon, and 2.75 rocket subsystems completed. We will also competitively develop the target acquisition and pilot's night vision and fire control subsystems. The subsystems will then be integrated for test and evaluation leading to the **Long Lead Time Item [LLTI]** production decision in June 1981 and full scale production award in October 1981.

Production & Procurement Objective. Over a five-year period (maximum production of eight per month), the Army currently plans to procure 536 AAH's. The production decision is scheduled for June of '81 with the first delivery in June of '83.

The Tentative basis of issue is:

Airborne Division	39
Air Mobile Division	75
Heavy Division (Selected)	36
Armored Cavalry Regiment	18
Air Cavalry Combat Brigade	129

CONTRACTORS

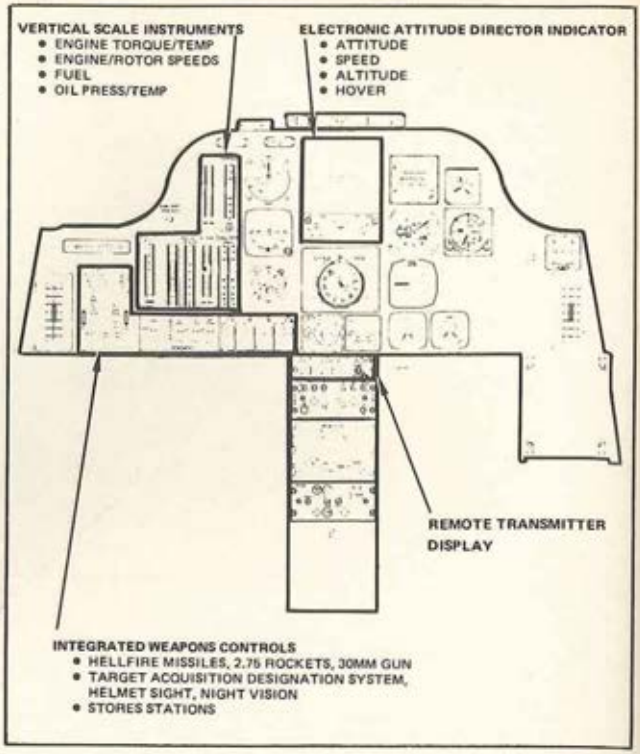
The major contractors involved in the AAH system development are:

Hughes Helicopters	Prime Manufacturer
Advanced Structures	Rotor Blades
Teledyne Ryan	Airframe
Litton	Main Transmission
Bendix	Drive Shaft
Bertea	Hydraulic Systems
Sperry	Auto. Stabilizing Equip.
Menasco	Landing Gear
Garrett	Press., Air, ECU, APU
Honeywell	Helmet Sighting
Aircraft Gear	Tail Rotor Gearboxes
Teledyne Systems	Fire Cont. Computer
Sperry	Multiplex Systems
Northrop	TADS/PNVS
Martin Marietta	TADS/PNVS
General Electric	Engine
Rockwell	Hellfire Missile
Hughes Helicopters	30mm Cannon
GFE	2.75 Rockets

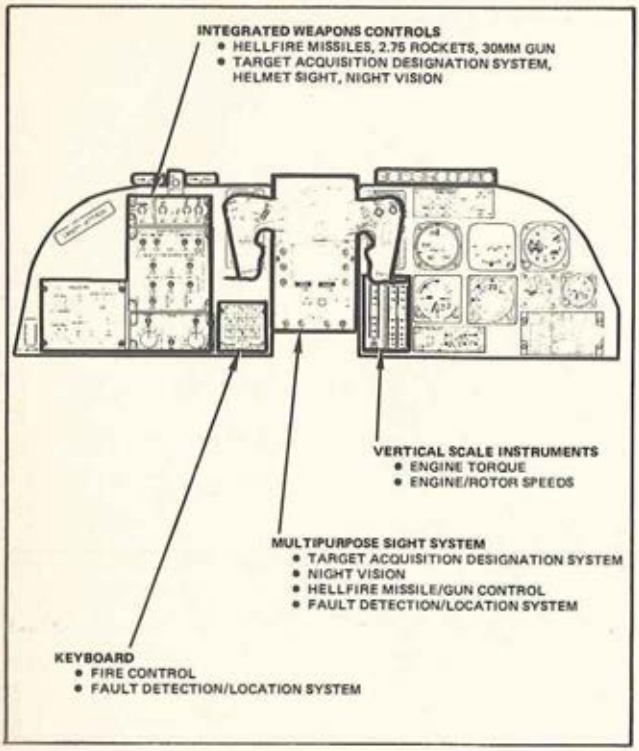
MANAGEMENT

The AAH is one of the Army's highest

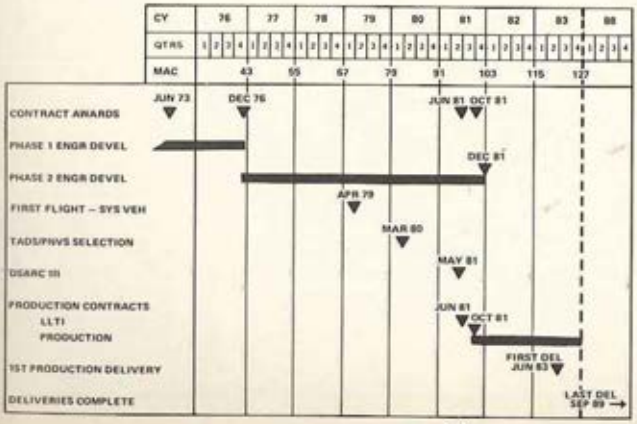
PILOT'S DISPLAY PANEL



CO-PILOT/GUNNER'S DISPLAY PANEL



AAH PHASE II SCHEDULE



MANAGEMENT [Continued]

priority programs and is the No. 1 aviation priority.

The AAH PM is chartered by the Secretary of the Army and reports to the Commanding General, USA DARCOM.

The Project Manager is delegated full line authority for the management and the technical direction of his project, and is responsible and accountable for total program planning, directing and controlling the allocation and the use of all resources authorized for the execution of the approved program.

New Structure

The AAH program is now structured under the new USA DARCOM multi-level project concept.

The Project Managers of the **TADS/PNVS** and the 30mm ADEN/DEFA developments report to the Advanced Attack Helicopter Program Manager, and use certain elements of the AAH staff to assist their respective project offices in their development efforts.

The faces that go with the names and titles are shown on the following pictorial AAH PM organization chart.

The initial chart covers the **AAH Program Management Team — Army,** while the scond covers the **AAH Program Management Team - Industry.**

The AAH Program Management Team [Army]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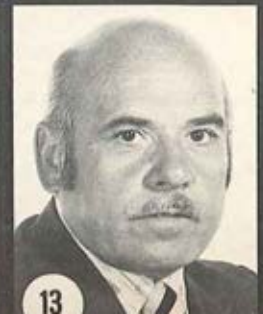
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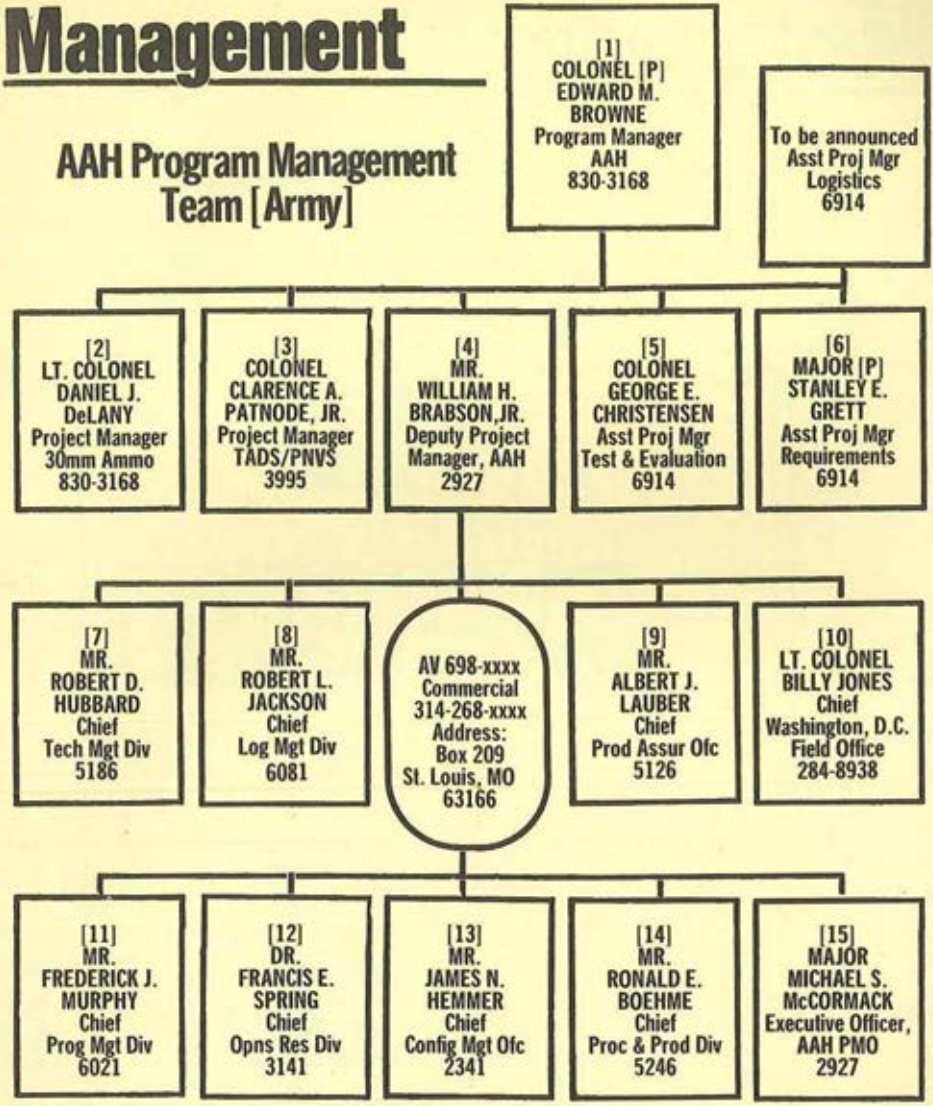
15

Management

AAH Program Management Team [Army]



PROJECT MANAGER'S COMMENTS

The AAH program developed is a composite effort of both Army and Industry. The contractor's organization chart (next page) arrays the **Hughes Helicopters'** team that has so adeptly translated the Army's AAH requirements into a most outstanding helicopter weapons system.

Management

PRODUCT ASSURANCE & FLIGHT OPERATIONS
L.P. SONSINI
Director

ORDNANCE
R.E. BRIX
Director

PROGRAM DIRECTOR
J.N. KERR

WEAPONS SYSTEM MANAGEMENT
R.G. HUNT

DESIGN
J.C. DENDY

CHIEF PILOT
R.E. FLETCHER

FLIGHT TEST
T.E. NESS

TEST DATA ACQUISITION
E.J. CURRIER

FACILITIES & PERSONNEL
J.A. CRABTREE

Hughes Helicopters

MANUFACTURING OPERATIONS
W.J. BLACKBURN
Director

DEPUTY PROGRAM DIRECTOR
N.B. HIRSH
PROGRAM MGT OFFICE

TECHNOLOGY
K.B. AMER
Chief Scientist

AIR VEHICLE MANAGEMENT
M.I. LEIB

TADS/PNVS MANAGEMENT
E.P. PREISENDORFER

PRODUCT SUPPORT
V.F. CREMONESE

FINANCIAL MANAGEMENT
R.E. GOVE

SUBCONTRACT MANAGEMENT
J.A. GREEN

MATERIALS, PROCESSES & STANDARDS
J.C. FRENCH

DTUPC & PEP
L.C. MILLER

MANUFACTURING ENGINEERING
G.M. JACOBSON

PROTOTYPE MANUFACTURING
F. J. PAEPER

PROJECT MANAGER'S COMMENT

Up to this point, we have covered the technical and design aspects of the program. Now, let's turn to the TRADOC **"User"** community and learn from **Colonel "Doc" Bahnsen,** the TRADOC Systems Manager, about what is going on in Advanced Attack Helicopter **Tactics.**

Garrett helicopter APUs: tough as the mission.

In war, helicopters must be tough and reliable. There's flack in the air when they blunt armored thrusts, fly close air support and deliver troops in combat assault. Modern military helicopters have to be fast and rough. Every component aboard must be able to do its job under the toughest conditions.

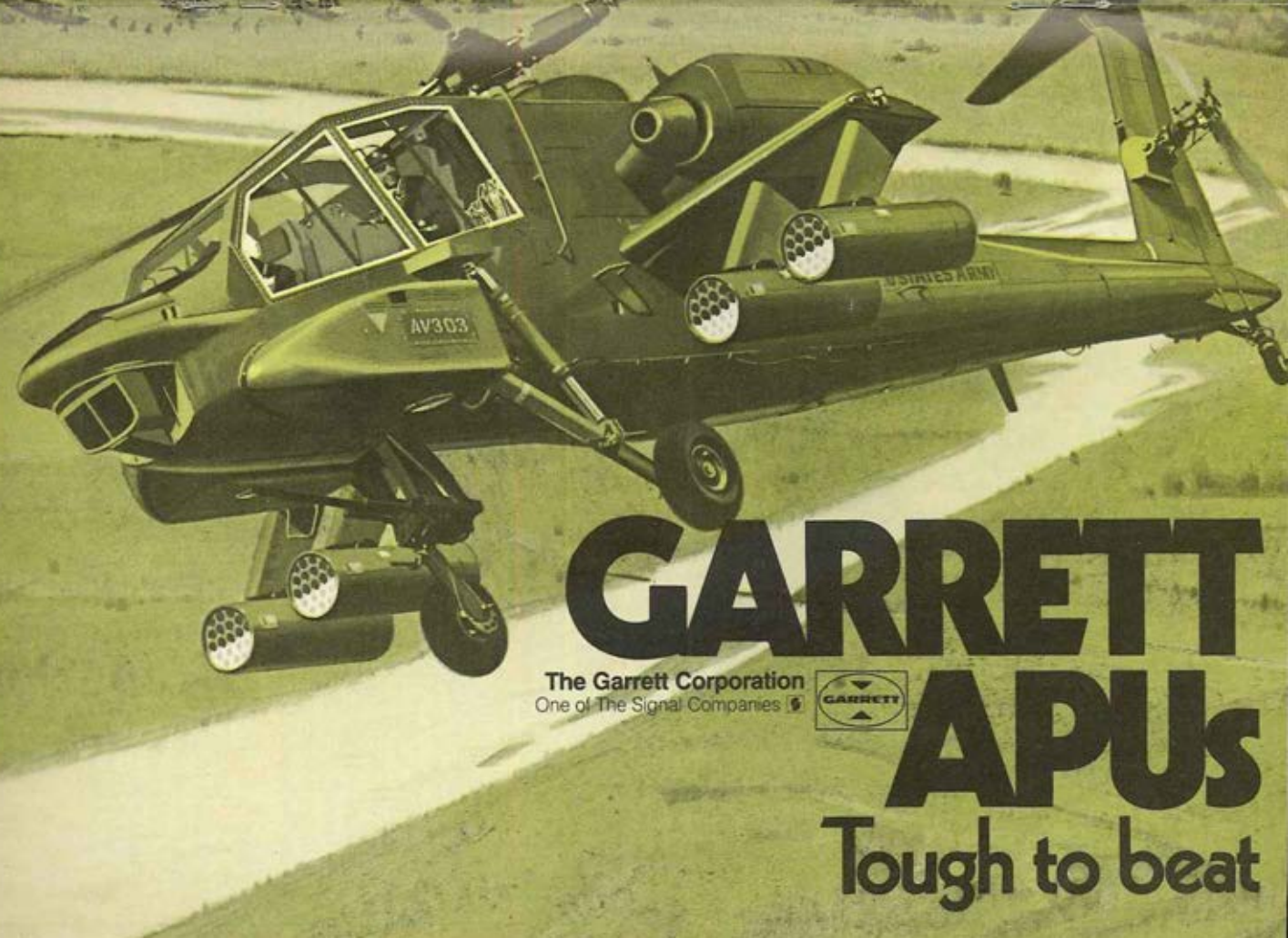
So it's no surprise that Garrett was selected to provide auxiliary power units for the U.S. Army YAH64. Garrett APUs also have been proposed for other military helicopter applications.

Garrett's gas turbine APUs for helicopters, like the ones certified on the A-10, are built to run long and strong. To survive the environment. And to deliver an extra measure of cost-effectiveness.

We can supply the APU, ready for interface with other systems. Or—as in the case of our GTCP 36-55 for helicopters—we can deliver a total performance package with lightweight advanced technology turbine, integrated single-plate dry disc clutch, and lightweight starter, all in one.

Garrett's been giving aircraft users what they want in APUs for 30 years. More than 30,000 Garrett APUs have logged some 105 million hours running time.

Whether the program is a combat or utility helicopter, military or transport aircraft, consider Garrett's APU experience. Nobody can match it or beat it. For details, contact: Sales Manager, Power Systems, AiResearch Manufacturing Company of Arizona, 402 S. 36th Street, Phoenix, Arizona 85034.



GARRETT

The Garrett Corporation
One of The Signal Companies

APUs

Tough to beat

By COLONEL JOHN C. BAHNSEN
TRADOC Systems Manager-AAH
Fort Rucker, Ala.

The User View

Tactical Employment of the AAH

What tactics will make attack helicopters effective on the modern, high-intensity battlefield?

How will attack helicopters be able to destroy opposing armor, yet survive in the air defense rich, high threat environment we expect to encounter?

There are numerous tactical areas of attack helicopter employment which need discussion. Here are a few questions being argued back and forth by Army Aviators:

- How can cannon and rocket suppression on the attack helicopter be used in conjunction with artillery fires, smoke, chaff, etc? These attack helicopter weapons make the system more versatile, more sustaining in all situations, and they enhance killing power and survivability.
- How will the employment of remote designation coupled with direct or indirect missile launch further enhance effectiveness and survivability upon AH-64/Hellfire introduction to our forces?
- How will the night and marginal weather terrain flight and target engagement on the AH-64 affect attack helicopter employment?

But to understand how to improv we must first know where we are in basic tactical employment. I believe the four most important fundamentals are

1. Combined Arms Team employment optimizes attack helicopter effectiveness.
2. Terrain flying is essential.
3. Engaging from maximum effective range, with minimum exposure time to threat ADA, is essential.
4. Most critical threat targets must be killed in priority.

Although not an all inclusive list, these critical aspects of attack helicopter employment should be common discussion points for all Army Aviators. They differ little from ground fighting techniques.

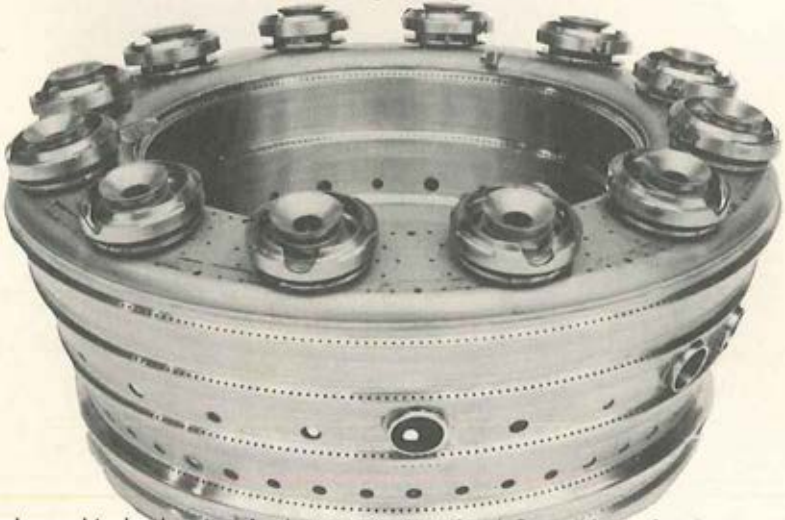
Consensus on fundamentals

I have found consensus among the attack helicopter community's tacticians on these four fundamentals. We need common discussion points and understanding by all Army Aviators in view of the fact that "wearing the wings" qualifies one as an assumed instant expert in explaining to non-aviators how the attack helicopter will fight on future battlefields.

First and foremost, attack helicopters comprise a key part of the **combined arms team.** They provide highly mobile, responsive killing power to the ground force commander. Attack helicopters will rarely fight alone. They can, but should not fight small, isolated, one-aircraft battles. The attack helicopter

T700 Reliability

Here's One of the Reasons Behind Unprecedented Engine Reliability for UTTAS and AAH



The T700 advanced technology combustor. When the Army established its UTTAS and AAH engine reliability goals, the combustor became a prime area for attention, because current operational engines are limited primarily by "hot section" life. New combustors or major repairs are needed after only a few hundred hours of operation.

The T700 goal? A combustor that will last 5000 hours. We're well on our way to achieving it. With more than 35,000 total engine hours experience, all combustors in the program remain operational. Several have already exceeded 1000 hours of operation. Not one has had to be scrapped.

Its reliability is a key reason why 75% less maintenance manhours will be required on the T700 when compared with current operational engines.

For UTTAS and AAH, the T700 offers the first real long-life combustor in helicopter engines.

205-158

The T700. The engine for the Army of the 80's.

GENERAL ELECTRIC

optimizes its mobility and speed of employment by using stealth and complementary supporting fires to bring quick destruction to enemy armor forces.

Coordinated efforts by all combined arms team members are critical to the attack helicopter's success. Multi-directional, sustained attacks are critical aspects of attack helicopter battlefield effectiveness. Enemy air defenses can be overcome best by integrated combined arms team effort, includeing ground, air, and attack helicopter fires. Once enemy air defenses are eliminated, the attack helicopter can wreak havoc with enemy armor formations.

Air Force tie-in is essential

Attack helicopter employment as part of the whole combined arms team—tanks, mechanized infantry, artillery, air defense and close air support—is a fundamental idea. For those who would knock other weapons systems on the battlefield, I would advise a bit of caution. This is especially true of Army officers criticizing our Air Force friends. The Air Force well understands the need for suppressive fires, smoke, chaff, flares, ECM, and integrated defense suppression in order for their primary killing effort to be effective.

Attack helicopters combined closely with Air Force close support and Army ground fires will certainly enhance the entire team's survivability, and simultaneously increase overall kill power. We don't need either/or; **we need all!**

It is also foolish to think that attack helicopters can replace large numbers of tanks or improved TOW vehicles (ITV's) or other armored killers. The attack helicopter adds unique mobility to the combined arms teams and it can fight on several different battlefields in the same day, miles apart—but it doesn't do other team members' jobs. I liken the attack helicopter to the wide receiver and the safety on a football team. Their speed and mobility can be critical to victory or defeat.

Trite . . . but true!

It seems trite, after several years of usage, to say that **"If you can be seen you can be hit and if you can be hit you can be killed,"** but nothing could be truer for the attack helicopter. **Use of terrain flying is essential** for successful employment of attack helicopters.

NOE movement, masked by available terrain, avoids enemy acquisition by visual, optical and electronic means, providing the attack helicopter protection from threat ADA and ground weapons. Avoidance of skylining, or creating a visible signature by dust, snow, leaves, etc., also enhances effectiveness. Careful use of terrain gives the attack helicopter enormous advantages in attacking targets. Surprise is gained, along with cover and concealment.

Even the barest desert terrain can provide an adequate firing position and reasonable protection if the terrain and shadows are properly used. Attack helicopters no longer attack from open areas, overfly the targets, or present flanking views to the enemy. Terrain usage, **not** armor plating and bravado, makes the attack helicopter survivable on modern battlefields.

Hand-in-hand with proper use of terrain, the tactic of **engaging from**

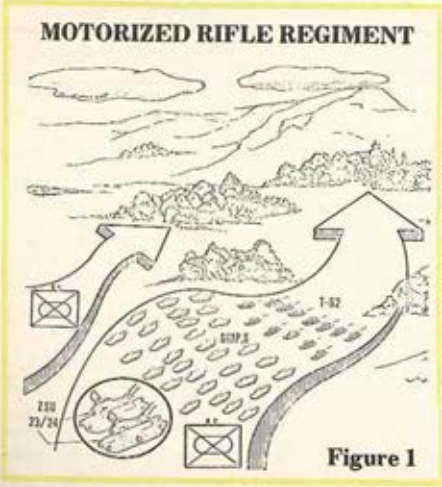


Figure 1

maximum effective range will further insure that attack helicopters will live and fight on future battlefields. Even if seen and engaged by the primary threat ADA weapons, the **ZSU-23-4**, the attack helicopter will be difficult to hit and kill **IF** maximum stand-off distances are observed.

This maximum distance will, of course, vary according to terrain intervisibility, weather, etc., but it is a key to being able to kill and not be killed. Accurate target acquisitioning, and use of all possible flanking and quartering attack angles, are basic techniques to this tactic.

The top priority

My fourth key thought on attack helicopter employment is the requirement for the critical threat weapons system being destroyed as a matter of top priority. In **Fig. 1, page 37** you will note the location of the **ZSU-23-4** in an enemy armored force.

The **ZSU-23-4** is normally found within 500 to 1,500 meters of the lead elements of a threat motorized rifle regiment. These weapons systems must be attacked and destroyed first by either a ground weapons system (artillery normally) or by the attack helicopter.

Techniques to do this with the attack helicopter have been developed and are currently being refined. It is risky business, and not easily done, but the use of the three tactics discussed above, plus the full use of radar warning systems, such as the AN/APR-39, make this a viable tactic.

Basically, the rule is to destroy the air defense first, by any means, then go after the other armored vehicles.

All in all, attack helicopter employment must be in sufficient quantities under coordinated direction to add surprise and heavy destruction to the capability of our war machine. The aviator employing attack helicopters must be comfortable fighting on the battlefield in the ground environment for he is, in fact, only a few feet above it.

He must be mentally flexible enough for quick maneuver over large distances and be aware of all aspects of the ground battle in several sectors, for without this he is only partially effective. In particular, the knowledge of the full capabilities and benefits of firepower integration is a must in order to suppress the target while killing it.

The AH-64 gives the Army a superb new dimension in its killing capability, not so much from its uniquemenss, but that it can perform and live better than ever in the combat environment of the modern battlefield. Fundamental employment tactics of the attack helicopter should not change significantly with this new helicopter; new machines simply enhance killing power and survivability.

A superb new dimension

Ingenious and skilled aviators will apply these basics and change them according to the machine's capabilities and the fighting situation. Perhaps we can devise some of these before the next war begins.

PROJECT MANAGER'S COMMENTS

In the materiel development process, the **Training and Doctrine Command [TRADOC]** represents the user. **Forces Command [FORSCOM]**, however, while outside the TRADOC family, must take the TRADOC concepts and the DARCOM hardware, and put them together successfully on the battlefield.

In that sense, FORSCOM and our existing deployed forces represent the "ultimate user." With this in mind, I have asked FORSCOM to join us in this issue with a perspective from the other user. **Colonel "Bo" Maddox,** Commander of the 6th Cavalry Brigade (Air Combat), has responded admirably in the following article.

By COLONEL BOBBY J. MADDOX
Commander, 6th Cav Brigade [Air Cbt]
Fort Hood, Texas

The Other User

"Dear Sirs or Ms."

"WE grow too soon old and too late smart" my father used to say with a sincerity that would have had old man Murphy reaching for his notebook in disregard of the copyright laws. And he was right!

Consider what that means for those of us in the profession of arms: that the combat experience of the **last** conflict may not at all be making us smart for the **next**!

Trench warfare gave way to the machine gun and the tank. Nukes seem to have somewhat discouraged large scale global conflict for wars of national liberation which may in turn, just may, have affected the somewhat larger and more intense battles in vogue in the Mid-East.

In any event, the Army hopes it is getting smart about the **next** unpleasantness. Charts of kill probabilities of the newest weapons system and various scenarios where they might have to be played have spawned a whole new body of the how-to-fight manuals as well as spirited debate over the How/When/Where literature designed to keep us from being too late smart.

Constant brainstorming

The 6th Cavalry Brigade (Air Combat) is trying to grow smart before it's too late. Here at Fort Hood, we are constantly brainstorming new and better ways to accomplish the Blackhorse Brigade mission to "locate, disrupt, and destroy enemy forces — predominately armored and mechanized units — by aerial combat power." For the Army, that represents getting smart in a big way.

Just think about the finger drill: 85 aircraft, 170 pairs of eyeballs, spread across the Corps front to locate the enemy and in the process, disrupt it. For the heavy work, there are 233 other helicopters working as a team to disrupt and destroy those armored vehicles; a total of, say, 1,200 or so extended range TOW missiles going downrange to kill maybe 800 tanks before lunch because afterwards, we have to be in the Corps area next door for another 800. That's a pretty awesome finger drill to me, and that's getting smart too.

Never before has a Corps Commander had that kind of firepower, a force that can be moved into battle from virtually anywhere in his sector in time - in terms of minutes instead of hours or days. If we're going to have to fight outnumbered, that's the kind of equalizer it will take to win.

Let's back up a little and figure out who does what for whom in the 6th Cav.

The 4th Squadron, 9th Cavalry has the locate/disrupt portion of the brigade mission. Pretty much the same structure as a typical Vietnam era air cav squadron, it has exactly the same mission — "Perform reconnaissance, provide security, and act as an economy of force combat unit."

Internally, there are some differences from other air cav units. The ground troop has been dropped because wheels and tracks just can't keep up with the aircraft. The recon platoons are manned by 11D armored reconnaissance specialists instead of 11B infantrymen, and they have two motorcycles per squad mounted on the UH-1 skids.

At this time the squadron is minus its "B" Troop and the brigade is short one attack squadron. This unhappy situation will be cured by the ARCSA III magicians. They can wave a wand and transform TDA flight detachments into air cav and attack troops in the next few years.

The disrupt & destroy part

The 7th Squadron, 17th Cavalry does the disrupt/destroy part of the brigade mission with a comparatively new structure. Each troop has 21 attack birds and 12 scout birds. With this aircraft density, the troop can put up three attack platoons of three to five each. That's three scouts controlling five guns which leads to the classic How/When/Where decision made by the troop commander:

Do I sustain fires by the one-third rule — have one platoon in contact, one at the rearm-refuel area, and one enroute — or, do I mass fires by giving it one big shot with everybody on line, and then disappear for awhile for bullets and gas?

The squadron commander makes the same decision, but with troops.

Finally, the 34th Support Battalion provides the brigade with the beans, bullets, gas, and wrench benders to keep everyone else flying.

But, I have digressed from my main subject which is to tell you how we're trying to avoid being too late smart.

First, our training centers around one axiom: "Observation is synonymous with destruction." **Hide** from the enemy's acquisition means. **Hide** in the trees or behind hills. Even on individual flights to get **CRF** minimums, assume an enemy situation; think about a **FEBA** someplace and what radars may be about to blow you away with direct fire or may be calling your coordinates to an artillery unit somewhere.

Know your ADA weapons!

Know everything there is to know about the family of Threat ZSUs and SAs and other health hazards that are dedicated to destroying you and **hide** from them. And, when you just have to look so you can report or shoot, then do it in 30 seconds or less, remask, and slide right or left so you can **hide** again.

Dismount your scout and let him ride those twin black Cadillacs up to the crest of the hill while you **hide** behind it. **Hide** electronically by using hand and arm signals, numbered flashcards, or flashing lights as a Morse code, and if you just have to talk on the radio, keep it short and sweet and do it while moving so that the direction finders shoot artillery where you **were**, not where you **are**.

Hide behind smoke, chaff, and a deception program, but if you want to tell your grandchildren how satisfying it feels to see a TOW hit 50 tons of steel - - first, last, and always — **HIDE!**

No one is going to kill an amazing number of Threat tanks without a good gunnery program to make them smart. Fort Hood has the very best! Operated on a quarterly basis, the Wolf Point complex began as a concept which would allow us to fly into the middle of the impact area and shoot in any direction.

HELLFIRE Modular Missile System

Advanced Technology to Overcome Numerical Superiority

HELLFIRE, the Army's next generation anti-armor weapon, assures full achievement of the AH-64's potential as a combat weapon system. AH-64 mission effectiveness is vitally complemented by inherent HELLFIRE capabilities:

SURVIVABILITY

Standoff Range—Launch from beyond the effective range of AA gunfire.
Multimode Launch—Indirect fire capability from hover or while moving at low altitude. Ground indirect fire has been demonstrated.

OPERATIONAL EFFECTIVENESS

Versatility/Modularity—Ground/airborne laser designation options. Missile designed to accept laser and next generation guidance modules tailored to defeat specific targets and to increase weather/night performance.

Accuracy/Lethality—Impact within INCHES of aimpoint with high kill probability even at oblique angles.
Firepower—Rapid, ripple, and single fire modes.

AFFORDABILITY

Exchange Ratios—AH-64 with full HELLFIRE complement and cooperative laser designation can engage and defeat multiple targets in one pass.
Design-to-Cost—Performance balanced with cost gives Army its best anti-armor weapon system buy.

Now in Full Scale Engineering Development by:

Rockwell International
Autonetics Group
Missile Systems Division

The Other User

What emerged was a two by six kilometer maneuver box that allows all Cobra munitions to be fired on headings from east through due west from a variety of terrain positions. That way, the pilot never gets to memorize a particular course or lane and his firing positions will be different every time he fires over a three year tour.

We thought Wolf Point was a really great range and that we were getting smart at shooting until someone pointed out that nearly all our shooting was done during the day, and what better way to **hide** than at night? So now, we do a lot more night firing, NOE flight to the firing position with AN/PVS-5 cav nav goggles, take the target hand-off from the scout, pop a 2.75-inch flare rocket, pick up the target, and punch off a TOW.

Since the more you do it, the easier it gets, we've started using pop-up and moving targets — and we're still doing extremely well! We've fired while wearing gas masks, though not much with the TOW because you just can't put your face down into the **telescopic sighting unit** [TSU] with mask on and not at night because you can't wear the cav navs with it.

Yes, we've stressed utilizing artillery with our TOW firing program. We've used artillery illumination; we've used tank searchlights for illumination; about the only thing we haven't done is fix six bayonets to the turret mini-gun — that's because we can't find a dummy that will stand the strain.

We've gained a lot from our brigade Gunnery Program and we continue to learn. However, where we really get smart is from all the things the individual troops and squadrons do. For example, the 4-9th (Real Cav) made a 600-mile one way move the hard way (no rail or MAC support) to Fort Bliss for an ARTEP last November.

Some lessons learned

Some of the lessons learned and relearned were:

- Artillery, close air support, and some ground forces mixed in are vital elements we are hard pressed to do without. You may as well put out a flashing neon sign that reads "covering force" with helicopters alone. We relearn daily that Army Aviation must be a part of the Combined Arms Team both to be effective and to survive on the mid-intensity battlefield.
- The need for clear, concise reporting — in view of the commo problems inherent in EW operations while spread over great distances — causes us to believe that extraordinary measures, not supported by the TO&E, are necessary. These measures include scout couriers, LNOs, and so on.
- Airspeeds that are slightly greater than translational lift and approaches to the ground are necessary to avoid dust signatures.

Even before the Bliss experience, we were learning from operations outside the Fort Hood area. We had a troop, C/7-17th, deploy to Europe as part of REFORGER 76. During the tactical phases of the REFORGER 76 exercises, they were OPCON to the 11th ACR in V Corps and OPCON to the 101st Airborne Division (Air Assault) in VII Corps.

They earned an overall 27:1 exchange ratio, i.e., for every helicopter "shot down" they "killed" 27 tanks. Some of the lessons they brought back to us include:

- The troop must utilize a jump TOC if

they are to have any hope of getting the word back to the "man" who needs it.

• Marginal weather works to the advantage of helicopters. This was an eyebrow-raiser at first, but think about it. The side that has air superiority is surely going to miss their jet fighters when the ceiling is down to about 200 - 300 feet but the attack birds will be there.

If visibility is down to around 2 to 5 kilometers — that's the optimum search ranges for our scouts — an enemy artillery observer will be denied the greater ranges he's accustomed to searching.

• An LNO located with the ground commander, which will insure that the attack ships are integrated into the scheme of maneuver, is essential.

• We can hide better if we fly **under** wires. We do it now, safely.

• Sometimes we have to violate the **HIDE** rule. Since the scout doesn't have stabilized optics, there are times when the AH-1S attack helicopter has to come forward and peek through his 13 power TSU to see if the scout has spotted friendly or enemy tanks concealed in a woodline.

"A lot of action in the desert"

Recently, the 7-17th (Heavy Cav) has had a lot of action in the desert where they took their Level 1 ARTEP. These exercises also help us get smart before it's too late through lessons learned:

• Dust and sand signatures **can** be avoided. But, once the enemy knows helicopters are present on the battlefield a commander can use them as a ruse.

• Enemy air can be defeated through the proper use of terrain and by staying within the shadows of the mountains. In addition, there is little need to worry about enemy air when you have a friendly combat air patrol watching the skies for you.

• The radar warning receiver is the greatest device yet invented for telling you where those troublesome ADA emitters are located so you can put them out of business immediately and get on with the main business of killing tanks while utilizing maximum standoff distances of our missiles.

Everything isn't rosy!

So, these are just a few of the ways we are trying to avoid becoming too late smart. Don't get the idea that everything is rosy because it isn't. We still haven't solved all the NBC problems, such as, how to decontaminate helicopters quickly with a simple spray or how to do almost anything useful with a protective mask on.

We know that the 2.75-inch rocket's developmental warheads — illumination, chaff, and smoke — are worth their weight in gold, but we don't see the aviation community battering down the project manager's door to get some. We believe a scout absolutely must have stabilized optics and a target marking capability.

We've done some work there by inventing the YAH-58, but the paper is still floating around in some headquarters and may not emerge until sometime after the first battle.

GOOD SHOW!

The AAH PM, COL[P] Ed Browne [right], gives an appropriate memento to Brig. Gen. Hans Drebing, the Director of German Army Aviation, on the occasion of an AAH program briefing and hardware demonstration held at the Hughes' Culver City facilities. Observing are members of the German aviation working group and Hughes Helicopters' executives. □

The Other User

We know that to become rich and famous all you have to do is invent a workable helicopter camouflage system, but so far no one has gotten close. But, the really troublesome thing is that the aircraft we have to work with are inadequate and they are also growing **too soon old.**

Yes, Dear Sirs or Ms., I know the **Cobra,** the **Huey,** and the **Kiowa** are good — but good isn't enough when we will have to fight outnumbered and win!

Let's take the **Cobra.** The AH-1G was just fine, but if you want to shoot a tank just forget it. It would be about as effective to sprinkle your canteen on the Threat's tank engine and wait for it to rust. The AH-1Q was better but with a load of bullets you couldn't put more than a jigger of gas in the thing.

The AH-1S will help a whole lot, but if it were carried in the Sears catalogue they still wouldn't call it "our best." No, Sir and M'am — what we really need at Fort Hood in the 6th Cav as the ultimate user is this:

- Something agile and maneuverable to slide out of one attack position and on to the next one faster.
- Something that has a real night vision gizmo **built-in** so we don't have to worry about squashing the cav navs in the bottom of the TA-50 bag.
- Something that operates "no sweat" in weather we now consider scary.
- Something, please, for a change with two engines so my insurance company will be moved to lower their rates.
- Something that will shoot that nice new Hellfire missile so we can hide better and further away.
- Something with, say, a 30 millimeter gun, so we can knock off those smaller targets — a commander's jeep for instance — that we must now let escape because a TOW costs too much for a small target.

I could go on and on (by now maybe you think I have) about why we need a new family of helicopters, why those we have are growing too soon old, and why we should have had them last week, but my typing finger grows tired.

Please run the following advertisement in your magazine:

WANTED: Advanced Attack helicopter. Will trade AH-1S w/high miles. Excel cond plus cash. Call AV737-3010 24 hrs.

ONE AND ONLY—COL Robert W. Bailey, left, talks about the tri-stimulus colorimeter in the Army Aeromedical Research Laboratory at Fort Rucker, a machine he developed to investigate basic visual color processes and color deficiences in a person's vision. The veteran left his command in late July after serving 12 of his 38 military years in that position. The former "James H. McClellan Aviation Safety Award" winner retired on July 29. □

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Today's partial panel. A premium you can afford.

By MAJ. GEN. JAMES C. SMITH,
Commander, U.S. Army Aviation
Center, Ft. Rucker, Alabama

Crew Training

Manning level: 1.5 to 2 pilots per cockpit

The dedication of this issue to the Advanced Attack Helicopter is significant because of the expanded dimension it adds to the future of the combined arms team.

Attack helicopters are Army Aviation's primary offensive combat power on the battlefield. Contrary to past experience and some less enlightened tactical teachings, it is not a fire support platform, but a frontline killer that takes the battle to the enemy.

It is a line-of-sight direct fire weapon which fights shoulder to shoulder with our armor and infantry forces. Attack helicopters do not loiter over the battle, but operate in the terrestial environment of the "tankers and grunts".

In view of this fighting orientation we are currnetly making extensive plans for the expansion of aerial gunnery ranges at Fort Rucker that will make tactical gunnery training more realistic and able to meet the needs of future battlefields.

The AH-64 armed with **Hellfire**, a 30mm cannon, and a new family of 2.75 in. rockets requires extensive range facilities and realistic target arrays. At Fort Rucker this necessitates rerouting a highway and other construction efforts. Work is progressing in this area.

AAH could outlast its pilots

The advent of the AH-64 will also require a close look at the way we select and train our pilots, the number of pilots required per aircraft, and the numbers of support personnel. It is possible that our maintenance capability will provide us with an aircraft that will outlast our pilots during combat, thus requiring day and night crews — in other words, a manning level of 1.5 to 2 pilots per cockpit seat. This is not new in the manning of combat aircraft and is quite common in many Air Force units.

It is obvious to the aviation community that the attack helicopter must be prepared for

Now in Army inventory:

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Helicopter trim and temperature system test times are reduced as much as 50% with Howell's BH112JB-53 Jetcal Analyzer/Trimmer. Now in Army Aviation Command Inventory (Stock #NSN 4920-00-372-4593).

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A new automatic heater probe control allows one-man operation and extends probe life.

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The trim module displays temperature and % RPM uncorrected or corrected to standard day temperature conditions . . . to reduce trim calculations, to lessen possibilities for errors.

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AAAA INDUSTRY MEMBER

Crew Training

of support personnel. It is possible that our maintenance capability will provide us with an aircraft that will outlast our pilots during combat, thus requiring day and night crews — in other words, a manning level of 1.5 to 2 pilots per cockpit seat. This is not new in the manning of combat aircraft and is quite common in many Air Force units.

It is obvious to the aviation community that the attack helicopter must be prepared for air-to-air combat on the next battlefield. We must develop tactics and train for air-to-air engagements as this is generally an unexplored area for most Army Aviators. The availability of airspace, and more importantly the "know how" to do this, is an area of intense interest here.

Survivability demonstrated

In June, a joint TRADOC/FORSCOM team conducted an Attack Helicopter **Tactics Development and Evaluation** [**TDE**] at Nellis AFB, Nevada. This evaluation (AH TAC Eval I) confirmed many of your tactics with minor modifications and significantly demonstrated the survivability of attack helicopter teams in the high threat environment.

Further joint Air Force/Army **TDE's** with the attack helicopter and A-10 working as a team, are scheduled for September and October of this year. Phase I of these joint **TDE's** will be conducted at Fort Benning and a follow-on Phase II effort later at Nellis AFB.

The TRADOC System Manager for Attack Helicopters, **COL "Doc" Bahnsen,** will head up the TRADOC team during these **TDE's.** His team of officers from Knox, Benning, Hood, Bliss, and AF-Attack Helicopters, **COL"Doc" Bahnsen,** will head up the TRADOC team during these **TDE's.** His team of officers from Knox, Benning, Hood, Bliss, and AF TAC, will be responsible for drafting a joint Air Force/Army "How to Fight" manual at the completion of these exercises.

Lest we in Army Aviation relax and rest on past battlefield accomplishments, you should all know that survivability of attack helicopters on the modern battlefield is a current serious concern of the highest echelons of our Defense establishment.

You should know also that the object of this concern is to assure that those of you who will fly and fight will not only be winners but survivors.

TRADOC SMO Personnel

COL John "Doc" Bahnsen, the TRADOC Systems Manager for Attack Helicopters, is the single point of contact and spokesman for the "user." His team of officers located at Fort Rucker will interact with the Project Manager-AAH.

The TSM office does not duplicate the PM, but works through the Commander, Aviation Center directly for the Commander, TRADOC. The TSM office consists of the following officers:

LTC Joe Moffitt - Training; **MAJ Jerry Hipp** - Personnel; and **CPT Joe Beach** - Logistics.

Its address is: U.S. Army Aviation Center; ATTN: ATZQ-TSM-A; Fort Rucker, AL 36362. AUTOVON 558-4619.

PROJECT MANAGER'S COMMENT

Last in sequence, but foremost in importance, is the assessment from the commander of our forces deployed in Europe, **General George S. Blanchard,** Commander-in-Chief, U.S. Army, Europe.

By GENERAL GEORGE S. BLANCHARD
Commander-in-Chief
U.S. Army, Europe

View from the FEBA

USAREUR's real need is the AAH

WE are in the midst of a major reorganization of USAREUR's Army Aviation assets. Our principal objective is to provide an organization that maximizes the "tank killing" capability of the Cobra/TOW (AH-1QS) helicopter.

Integration of the system into our armored cavalry regiments (one attack company of 21 aircraft), divisions (two companies of 21 aircraft each), and corps (three companies of 21 aircraft each) will, in my opinion, tip the scales of the armor/anti-armor battle in our favor.

The ACR's and Div's reorganization will be complete by end of CY77, while the corps assets are being programmed for the early 80's.

I am delighted that DA has recognized our attack helicopter requirements and is providing us with the best system now available, i.e., the AH-1S. However, our total need is not yet being met. The threat facing our forces' Central Army Group and Northern Army Group, as we move toward bolstering that sector, is formidable in both armor and air defense forces.

"Critical to our success"

The AAH with its improved survivability, its increased staying power during night and adverse weather (Pilot Night Vision System and Target Acquisition and Designation System), its capability to engage multiple targets rapidly with HELLFIRE with minimum exposure, and its great growth potential, are truly critical to our success in the land

View from FEBA

battle of Europe during the 1980's.

The ARCSA III Study determined that the AAH is some 2½ times as effective in the anti-armor role as the AH-1S. I have a great deal of confidence in those figures. Increased mobile combat effectiveness of this magnitude is what we need to counter the vast imbalance in tanks which exists between NATO and Warsaw Pact forces.

In summary, the Attack Helicopter is critical to our success in the anti-armor battle in Europe. The AAH with its significantly increased combat effectiveness is needed now. Program delays will be highly detrimental to our combat posture in the mid- and late-80's. The AH-1S is a good anti-armor weapons system; however, for the future years we need the increased capability of the AAH.

LOOK-SEE-Congressman Jim Lloyd [D-CA, 35th District], cen., receives a YAH-64 flight patch from AAH PM COL[P] Ed Browne, left, after a recent demonstration ride in the Army AAH. Thomas R. Stuelpnagel, Vice President & General Manager of Hughes Helicopters, joined the duo.

Summary by the AAH Project Manager

So, there you have it — the **AAH/Total System for Battle** story. All of us associated with this development are extremely proud of the Advanced Atttack Helicopter. It is truly advanced in every sense of that word. Hot day performance with a full payload of HELLFIRE missiles, 2.75-in. rockets, and/or 30mm ordnance will be the best in the world.

The latest state of the art in target acquisition/designation and pilot's night vision will allow us, for the first time, to routinely engage the enemy in adverse weather, and day and night at standoff ranges; the HELLFIRE, 2.75-in. and 30mm armaments will provide us the most lethal weaponry combination ever incorporated into a helicopter.

The survivability features designed into the YAH-64 are unprecedented in helicopter development. All of these — and finally the concepts of TRADOC and FORSCOM experts for training and tactical employment — will result in the AAH bringing a new aerial dimension to the Combined Arms Teams' anti-armor lethality.

In closing the AAH-dedicated issue, my pledge to you is that I will strive consistently to guide this development to yield a superb attack system at the earliest possible time. Our goal, from General Guthrie, the DARCOM Commander, on down, is to provide the Army with the best helicopter weapons system in the world — a truly Advanced Attack Helicopter you can fly into battle against numerically superior forces knowing that you have the opportunity to come away victorious.

Sikorsky chooses experience:

SOLAR TITAN APU WILL FLY ON UTTAS

When you're aboard every production military helicopter that uses an APU, you must be doing things right.

And Sikorsky Aircraft Division of United Technology Corporation has chosen the Solar® *Titan*® turbine auxiliary power unit for its winning UH-60A entry in the recent UTTAS competition, which kept our batting average at 1.000.

Altogether we've designed and built more than 8,500 turbine APU's that have totaled up 15 million operating hours. That's experience.

And when you've got that kind of experience, you've learned how to build in reliability and that's the one quality an APU can't do without.

The *Titan* APU has an extra margin of performance for every pound of weight and low life-cycle costs.

But when you depend on your APU for starting and auxiliary electric and hydraulic power, the main thing is it has to work.

And Solar's APU works — reliably.

Selection for every production military helicopter that has an APU, the new F-16 jet fighter and many commercial aircraft and business jets says a lot. But there's more to say.

So write Solar, an International Harvester Group, Dept. Z-280, San Diego, CA 92138. We'll send you the facts and then let our *Titan* turbine APU speak for itself. With the voice of experience.

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Now joining the front ranks.

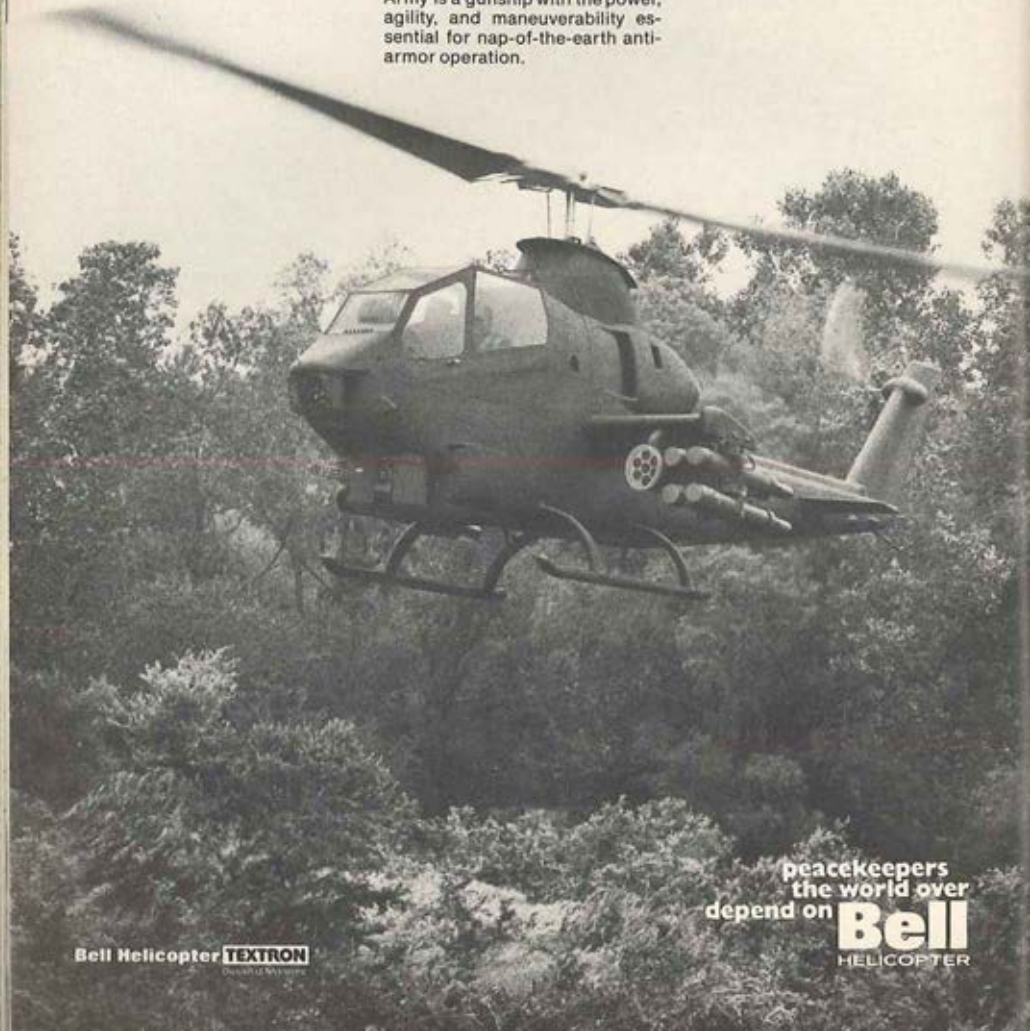
The most advanced gunship technology available is in the Army's hands right now—when they need it. It's the AH-1S—now in production and being delivered to field units.

Evolutionary development reduced risk and shortened development. In carefully planned, affordable program steps, Bell and the Army combined the combat-proven Cobra with the latest available technologies for mission effectiveness and survivability.

What Bell is delivering to the Army is a gunship with the power, agility, and maneuverability essential for nap-of-the-earth anti-armor operation.

New features provide increased survivability, NOE cockpit compatibility with night vision goggles and reduced glint canopy to name a few.

This new gunship is ready to meet the Army's anti-armor needs now and well into the future.



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A highly qualified observer calls for an annual review of airmobile doctrine in view of the new developments in aircraft and weapons.

Airmobility

A new Board on Army Aviation is fourteen years overdue.

By General Hamilton H. Howze, U.S. Army, Ret.

I HAVE in the recent past visited both the 101st and the 82nd Airborne Divisions. In both cases I was much impressed by the appearance of the officers and men: Lean, sturdy, smart looking soldiers, alert and neatly uniformed.

In each case also the division staffs were good enough to brief me on what they considered probable division overseas missions on certain international contingencies. In both cases the use (or non-use) of light aircraft was of obvious applicability: the numbers available and their employment would in large measure determine the outcome of the battle. And I came away from those briefings with an uneasy feeling that the Army has in some major respects forgotten much of what it once knew about air mobility.

It is true, of course, that the Army is spending lots of money to develop and bring into production two new helicopters, the UTTAS and the advanced attack helicopter. This is undeniable progress, but the quantities intended for purchase are not impressive, and neither are the number and size of units that are to be equipped with them.

We ended the Vietnam War with two airmobile divisions; we now have one, and that one faces major cuts in strength. We have only one so-called air cavalry combat brigade, which is really not air cavalry but an aerial tank-destroyer force. It has considerable capability in that role, but along with the airmobile division it also may feel the chop.

I recently had access to the Army's new operations manual, FM 100-5. There is periodic acknowledgment therein of the usefulness of light aircraft, but it is a patch job, with paragraphs apparently being added to an earlier but recent version. Quite obviously Army Aviation is not contemplated in the manual as a basic tool—as a strong, added, available and sometimes decisive capability, as it emphatically should be.

The Answer: "Nothing."

And a few months ago I talked to a number of young officers who were just graduating from the Advanced Class at the Artillery School. I asked the group what the course had included about the techniques of artillery support of airmobile operations. The answer: nothing.

I am guessing now, but I venture to

say that Fort Sill has developed no special technique for the purpose. I am **not** guessing when I say that such a technique will be different from the normal, will require special training, and will be very applicable to the winning of battles.

Because of the foregoing, because of periodically expressed concern about helicopter vulnerability, because of a pronounced dwindling of what used to be an enormous enthusiasm in the Army for airmobility and its practice, and because of current emphasis on the ground

"We are . . wrapping ourselves in armor and thereby losing a big part of mobility."

mechanization of practically everything, I think the Army is engaged in the implementation of a monumental error in judgment.

We are, in the words of George Patton, taking too much counsel of our fears, and in consequence wrapping ourselves in armor and thereby losing flexibility and a big part of mobility. The helicopter is as vulnerable as a calf to a tiger if one employs it foolishly, but vulnerability will drop to acceptable levels if it is used cleverly and in conjunction with other weapons that can help it.

But given the tank and the armored personnel carrier, do we really need the helicopter as a combat vehicle? Sometimes a question can be answered best by a return to fundamentals. And the fundamental truth is that battles are won by a combination of firepower and mobility, and when the two get out of balance the result is a relatively ineffective fighting force.

Firepower has grown enormously since World War II, mobility much less so unless the helicopter is employed. Tanks and armored personnel carriers move at about the same rate as they did 30 years ago, and the act simply of providing more of them does not provide a given unit - say an armored or mechanized force - much more mobility than it had before.

But what can the helicopter do? I list a few things, things apparently overlooked now by much of the Army:

It can provide unparalled battlefield mobility. It is an obstacle crosser: natural obstacles such as mountains, cliffs, rivers, dense forests, swamps, lakes and wadis; and artificial ones such as mine fields, contaminated areas, demolitions, artillery fireswept areas, barbed wire and, on occasion, even enemy positions. Most battlefields are an agglomeration of obstacles. And only the helicopter can cross them quickly and easily - and substitute 140 miles an hour for 10 or 15.

It can provide surprise, often the key to victory, by the very quick and totally unpredictable shift of troops and firepower from one place to another.

It can provide, as nothing else can, very exceptional observation of battlefield terrain.

It provides a highly mobile and elusive platform for very powerful weapons.

It has excellent communications, and can serve as a very efficient messenger during radio silence or when radio fre-

. . but I must say nevertheless that the helicopter is a magic machine."

quencies are jammed.

I must guard against overstatement, but I must say nevertheless that the helicopter is a magic machine. Given its unique capabilities and the "multi-quantum" (if that's an admissible expression) jump it provides in **most of the**

essential and useful qualities of a military machine, it is simply inadmissible to dismiss it on the grounds that it may be shot down.

The approach must be to determine, by intense and frequent practice, how to use it properly. It is certainly unnecessary to specify that the helicopter must not be subjected to enemy fire, but it is true that a major part of its usefulness can be exploited without doing so. And when it must be exposed much can be accomplished by artillery and other weapons in protecting its flight path - if we learn how.

Right after the 1973 Arab-Israeli War, General Peled, the Chief of Staff of the Israeli Air Force, was quoted by the unbelievers as saying that the helicopter could not be employed at the forward edge of the battle on the Suez Canal. No doubt he was right - neither could any kind of aircraft, including fighters, in the extremely intense anti-aircraft environment that prevailed on that very short front, but which would **not** have prevailed had the front moved a few miles to the east or west, as it was about to do when the cease-fire came.

Shortly after the war General Peled

"After the 1973 Arab-Israeli War, General Peled came to the US . . to buy helicopters."

came to the United States. Why? To buy helicopters, particularly Cobras, for the Israeli Air Force.

In its report issued in the late summer of 1962 the Army's **Tactical Mobility Requirements Board**, sometimes known as the Howze Board, recommended that successor but smaller boards be convened every year to reexamine the Board recommendations and to see how things were going in the expansion of what the Board called an almost revolutionary development in ground battle tactics.

I would recommend now that this be done as soon as practicably possible. because the action is exactly 14 years overdue, the new Board should do more than just a review; I would hope that it might be blessed by an almost unrestricted charter, as ours was. The Board should draw on the best tactical minds in the Army, on the other services, on operations analysis contractors, on industry as applicable, and on whatever other talent it might find, as ours did. The Board should be provided the terrain and the means to experiment informally with equipment and organization to its heart's content, restricted only by time and, of course, reason, as ours was.

The Board's chief purpose should be to bring airmobile doctrine up to date in view of new developments in aircraft and weapons, ground and airborne. New statements on feasibility and vulnerability are necessary - what will work and what won't, and what tactics and techniques are necessary to take advantage of the helicopter's enormous mobility and flexibility at acceptable rates of loss.

WELCOME!—MG Alton G. Post, Honorary President of the David E. Condon (Ft. Eustis) Chapter, presents an AAAA Certificate of Honorary Membership to **COL T.B. Eustis,** 2d from right, Ft. Eustis CofS, at a professional meeting as **Ralph P. Alex**, former Sikorsky R&D executive and guest speaker, left, and **COL Richard L. Stoessner,** Chapter President, look on. □

The Board should determine and recommend an optimum organization for the air assault division, and how many the United States should have. We habitually make the decision on the basis of 16 active Army divisions, forgetting the Marine divisions, the National Guard and Reserve divisions, and the fact that anywhere we fight overseas - Europe, Korea, the Middle East - we will be fighting alongside other and all non-airmobile divisions of our allies, where-

"The Army hasn't pursued with vigor the development of a highly useful capability."

for the United States should have a disproportionately large number of airmobile forces.

I would hope also for a reconsideration of the air cavalry brigade, which I contend should be a homogeneous unit based on a platoon consisting of scout helicopters, two squad of riflemen riding in UTTAS or Hueys, and a couple of armed helicopters. This would be an extremely powerful little force, capable of an enormous range of missions: reconnaissance, delay, rear area surveillance and protection, raids, the protection of a long flank, pursuit and exploitation, anti-tank action and others. In a desert area it could keep a couple of hundred square miles under constant surveillance, and effectively delay the progress of an enemy ground unit twenty times its size.

Each troop in my suggested brigade would have three identical platoons, each squadron three identical troops, and the brigade three identical squadrons. I believe each corps of our Army should have such a brigade. Given the assistance of artillery and engineers such a brigade could **delay** an assault by a Soviet armored corps - giving up ground slowly, meanwhile inflicting heavy damage - better than any reinforced armored or mechanized division in the world.

BEST!—The AAAA's Aviation Center Chapter selected, l. to r., **SSG Gerald Johnson**, as local "Aviation Soldier of the Year" (1976); the Silver Eagles, represented by **LTC Benjamin B. Powell, Jr.**, cen., as "Outstanding Aviation Unit of the Year" (Army); and **MAJ Donald R. Byars**, Cdr, 282nd Avn Co (USAR) as "Outstanding Reserve Component Unit of the Year." The three hold AAAA medallions as winners.

Tree tops: A Russian orb!

And finally the Board's activities should conclude with a walloping big demonstration to show the DOD, the Army, the Navy, the Air Force, and the Marines what can be done. If I may be permitted the boast, our demonstration in 1962 was impressive not only because it was quick and violent but also because it was convincing. None of the scores of senior officers who saw it ventured to attack it on the grounds of feasibility.

Let me conclude with the apology due from a man 12 years out of the active Army. But I cannot escape the conviction that the Army has not pursued with vigor the development of a highly useful capability at the same time that the Russians, once far behind us in equipment, doctrine, tactics and technique, are borrowing from **our** experience and markedly improving their ability to exploit that shallow but critically important layer of atmosphere just above the tree tops. □

By MAJ. GEN. JAMES C. SMITH,
Commander, U.S. Army Aviation
Center, Ft. Rucker, Alabama

Training

New maintenance facility dedicated

SINCE I communicated with you last, we have had two important ceremonies here at the Aviation Center. Our Memorial Day was marked by the dedication of our maintenance training facility in memory of Sergeant First Class Rodney J.T. Yano.

Many of you possibly know or I'm sure have heard of Sergeant Yano who while serving as a crew chief gave his life to save the other crew members of his helicopter in Vietman. He was awarded the Congressional Medal of Honor posthumously. I feel it most fitting that we have been able to show this appreciation and respect for this brave aviation enlisted man.

I was extremely impressed by the opening soldierly remarks of **Colonel John Bahnsen,** who was the commander of the aircraft on the day Sergeant Yano performed so heroically. He stated simply, "I owe my life to the unselfish and heroic deeds of Sergeant First Class Rodney J. T. Yano."

Then on 4 June, we held our aviation birthday and inducted seven distinguished aviation personnel into the Army Aviation Hall of Fame. All of the day's activities were most successful and well received. The privilege of hearing remarks by **General Hamilton Howze, LTG "Bob" Williams,** and our inductees was not lost on the fine audiences both at the Hall of Fame induction and the following dinner.

Once again I have a variety of articles for you from the directorates and agencies here at Fort Rucker. I feel they will help you keep up with our activities here and enhance your knowledge of new aviation developments.

COL Bahnsen

SFC Yano

Rotary Wing Aviator Refresher Training [RWART] Course

This course is designed to provide aviator personnel returning from nonflying assignments, with refresher training to enable successful rotary wing instrument requalification and familiarization, and with current aviation threat doctrine, tactics, and techniques.

Prior to attendance each student will be sent an exportable preparatory training package which must be studied and completed prior to his arrival at Fort Rucker. This training packet is aimed at reacquainting the aviator with instrument procedures and applicable U.S. Army and FAA regulations.

Total flight hours resourced for this program include 12 UH-1 flight simulator hours and 18 hours in the UH-1H

(three consisting of instruments). Tactical/combat skills refresher flights will include all modes of terrain, tactical night, and flight with the night vision goggles.

Academics will emphasize instrument procedures, communications and communications security, electronic warfare, tactical navigation, the threat, and UH-1 aircraft systems familiarization. Academics total approximately 72 classroom hours.

This course began on 25 April 1977 with a student load of ten aviators per class beginning every week for a total of 500 refresher training quotas per year. Currently we are researching the possibility of providing fixed wing refresher training for those aviators enroute to fixed wing assignments.

Broken Wing Award

Twenty-one aviators were awarded the **Army Aviation Broken Wing Award** by the U.S. Army Agency for Aviation Safety during the first five months of 1977.

The **Broken Wing Award** is given to aircraft crewmembers who demonstrate a high degree of professional aviation skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in Change 5 to AR 385-10.

Nominations can be made by any person having knowledge of the event. They should be submitted within 15 days in letter form, without indorsements, to the Commander, USAAAVS, ATTN: Chairman, Broken Wing Award Committee, Fort Rucker, AL 36362.

NEW FACES—BG James H. Patterson [left] became DCG, USAAVNC, Aug. 21. The DSC holder is a Master Army Aviator. COL Stanley C. Knapp [right] became Army Aeromedical Research Lab commander on July 29.

Broken Wing Award Recipients
(Assignment at time of Award)

CW2 Ande J. Albert, 118th Avn Co
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CW2 Charles S. Barnes, Co B, 4/77
APO San Francisco
Ft. Campbell, Kentucky
WO1 James A. Carlsen, Trp C, 3/5 Cav
Ft. Lewis, Washington
CW2 James C. Cole, IN-ARNG
CW3 John R. Dougherty, USAACEBD
Ft. Bragg, North Carolina
CW2 Curtis L. Franklin, HHC, 172 Inf
APO Seattle 98749
CW2 Frank T. Klotz, 155 Avn Co
Ft. Ord, California
MAJ Wm. McCormick, Avn Spt Facil
West Virginia ARNG
DAC Billy B. McPhail, A Trp, 7/17 Cav
Ft. Hood, Texas
1ST James A. Moen, Co B, 158 Avn Bn
Ft. Campbell, Kentucky
CW2 Raul Ortiz, USMAAG, Ethiopia
CW2 Michael A. Pancake, 9th Avn Bn
Ft. Lewis, Washington
CW2 Allen L. Pegram, C Trp, 4/9 Cav
6th Cav Bde, Ft. Hood, Texas
CW2 Dean M. Resch, USAADTA
Ft. Rucker, Alabama
WOC Russell Schindelheim, 62 Co
Ft. Rucker, Alabama
CPT Jerome P. Showemaker, 40th Inf
CA-ARNG
DAC James R. Smith, Doss Aviation, Inc.
Ft. Rucker, Alabama
CW2 Marion F. Standridge, DUFT
Ft. Rucker, Alabama
CW3 Gregory A. Waltz, 1 Avn Co
Ft. Riley, Kansas

[VIEW/Cont. on Page 60]

Development in Helicopter Aviation Medicine [HAM]

Major General Spurgeon Neel, MC, MFS, Commander, US Army Health Services Command, Fort Sam Houston, Texas, was the featured speaker of the Helicopter Aviation Medicine Panel at the Aerospace Medical Association Annual Scientific Meeting at the Las Vegas Hilton, 9 May 1977.

Colonel Raphael J. DiNapoli, Jr., MC, MFS, then Commander, U.S. Army Aeromedical Center, Fort Rucker, Alabama, chaired the Panel which is expected to become an annual event.

Other participants included **COL Robert W. Bailey**, MSC, US Army, Commander, US Army Aeromedical Research Laboratory, Fort Rucker; Commander C.H. Bercier, Jr., US Navy, Senior Medical Officer, Marine Corps Air Station, Beaufort, SC; LTC R.W. Fassold, Command Surgeon, Canadian Armed Forces, Winnipeg, Manitoba; and Surgeon Lieutenant Commander A.P. Steele-Perkins, Royal Navy, stationed at the Royal Air Force Institute of Aviation Medicine, Farnborough, Hants, U.K.

Besides the Panel itself, the total Helicopter Aviation Medicine Program included the US Army Aviation Center Night Vision Goggle demonstration booth, operated by CPT James E. Johnson, Directorate, Training Development at Fort Rucker, which was on continuous display during 9-12 May.

A series of films on the UTTAS and the AAH were also shown on a recurring basis throughout the meeting.

The Helicopter Aviation Medicine Panel was well received by several hundred Flight Surgeons and scientists, most of whom stayed 45 minutes beyond the allotted time in order to continue the discussion.

The status and trend figures for military and civilian rotary wing aircraft in the U.S. (37% of DOD aircraft are R/W), Canada, Western Europe, and Russia, were eye-openers for an organization whose historical roots stem from fixed wing aviation and space technology.

In a separate matter, the annual scientific meeting of the Aerospace Medicine Panel of the NATO Advisory Group for Research and Development (ASMP-AGARD) will be held at Fort Rucker 1-5 May 1978.

For the first time, this meeting will be devoted solely to the special problems of operational Helicopter Aviation Medicine (HAM). Approximately 100 highly qualified technical specialists in aerospace medicine from all or most of the NATO countries are expected to attend.

(***Boldface** denotes AAAA member.)

NEW COMMANDER

The Army Aircraft Development Test Activity at Ft. Rucker, Ala., has a new commander, COL William E. Crouch, Jr. He served previously as chief of the Aviation Systems Division, ODCRDA, in Washington, D.C. for three years. □

TALK SHOW

MAJ William S. Reeder (center) and **CW3 Roy E. Ziegler, II**, are interviewed by an American Forces Network, Europe, reporter about their captivity while prisoners of the North Vietnamese during the Vietnam conflict. Major Reeder met Mr. Ziegler in the "Hanoi Hilton." Both officers are assigned to the Aviation Battalion, V Corps, in Hanau, Germany. □

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