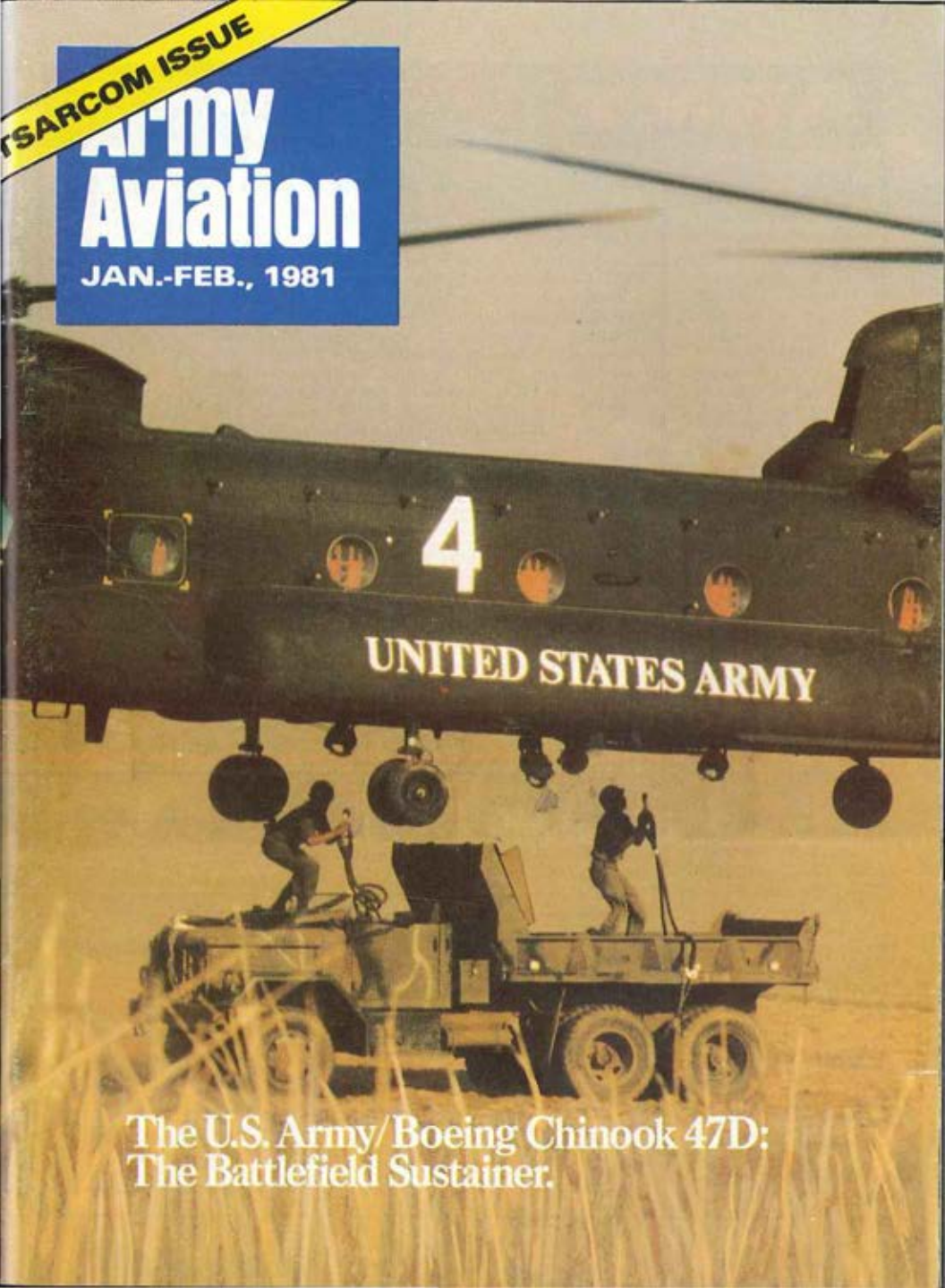
rSARCOM ISSUE

Army Aviation

JAN.-FEB., 1981



The U.S. Army/Boeing Chinook 47D:
The Battlefield Sustainer.

ARMY AVIATION

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

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FEATURES

SPECIAL TSARCOM REPORT

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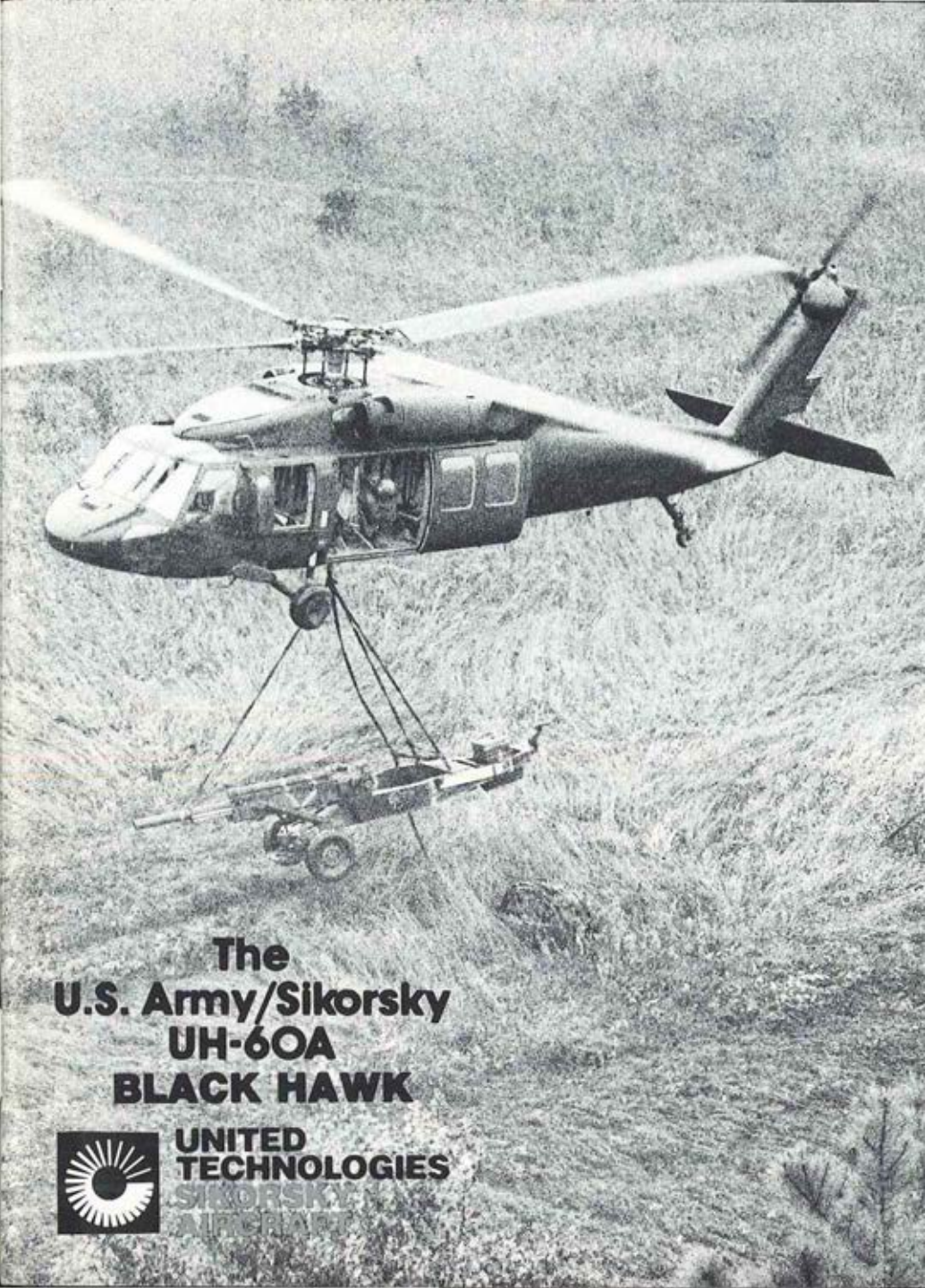
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January 31, 1981

CONGRATULATIONS!

By the time you read this letter in early February, AAAA's 18-member National Awards Committee will have met in successive full-day meetings in Washington and will have selected our national awardees for 1981. These include some 12-15 winners of AAAA National Scholarships, and the winners of the "AA of the Year", "Aviation Soldier of the Year", DAC of the Year", and 'Outstanding (Army) and Reserve Component Aviation Units of the Year." The Association's sixth major awardee, the winner of the "James H. McClellan Aviation Safety Award", was also selected at these meetings. Congratulations to all of the individual selectees and we look forward to meeting all of the National Awardees at our April 23-26 Convention in Washington.

GARMISCH PLANS WELL UNDERWAY

Under **Brigadier General John W. Woodmansee,** USAREUR Regional President; **Colonel "Nate" Pulliam,** the Senior VP; **Lt. Col. DeWitt Irby,** Regional VP, Industry Affairs; and members of the 421st Medical Company (AA), the 1981 Host Unit, the 1981 USAREUR Region—AAAA Convention at Garmisch this March 25-28 looks like a big winner. Some 350 ski-week slots (up from 200 in 1980) have been reserved for the European AAAA members and their families. One notable change after 21 years — all professional programming will be conducted in the afternoon with the mornings set aside for the slopes. This professional-social gathering remains as one of AAAA's finest membership activities!

THE HELICOPTER WORLD CHAMPIONSHIP (HWC)

We hope to bring you the results of the February FORSCOM fly-offs at Ft. Hood in the next issue, and will report on the Army-wide fly-offs at Ft. Rucker in March. For more information on the Army competitions for spaces on the **United States Helicopter Team,** turn to page 70 for **Maj. Gen. Carl McNair's** update. The fifth competition event, as described by the Polish Aero Club, may be found on the inside back cover.

George S. Beatty Jr

GEORGE S. BEATTY, JR.
Major General, USA (Retired)
President, AAAA

20 MM CANNON

TOW MISSILE

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Every ounce of fire power.

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What's more, the AH-1S can handle other advanced weaponry including Hellfire.

This new Cobra is designed to strengthen our anti-armor for the next two decades! Fire control is just one of the AH-1S traits of tomorrow found in the Cobra of today.

Bell's AH-1S Cobra: Everything's new but the name.

Advance Registration Form for AAAA's 23rd National Convention, 23-26 April

SHOREHAM HOTEL, CALVERT ST., & CONN. AVE., N.W., WASH., D.C. 20008 – THURSDAY, APRIL 23, 1981 THROUGH SUNDAY, APRIL 26, 1981

I plan to attend the functions of the 1981 AAAA NATIONAL CONVENTION indicated below and have enclosed a check made payable to "AAAA" to cover the costs of my attendance and the function tickets. I understand that I may receive a full refund for the foregoing through 3 April 1981.

FUNCTION HELD AT THE 1981 AAAA NATIONAL CONVENTION	MILITARY MEMBER FEE	CIVILIAN MEMBER FEE	MILITARY CHAPTER DELEGATE	CIVILIAN CHAPTER DELEGATE	FEE FOR ALL SPOUSES	NON-MEMBER FEE*	ITEM LINE TOTAL
REGISTRATION (NECESSARY FOR ADMITTANCE TO AAAA) PROFESSIONAL SESSIONS	☐ $12.00	☐ $30.00	☐ $8.00	☐ $26.00	N/A	☐ $45.00	$
FRIDAY, APRIL 24, 1981 MEMBERSHIP LUNCHEON	☐ $12.00	☐ $16.00	☐ $8.00	☐ $12.00	☐ $12.00	☐ $16.00	$
FRIDAY, APRIL 24, 1981 PRESIDENTS RECEPTION	☐ $9.00	☐ $15.00	☐ $6.00	☐ $12.00	☐ $9.00	☐ $15.00	$
SATURDAY, APRIL 25, 1981 INFORMAL LUNCH	☐ $7.00	☐ $9.00	☐ $5.00	☐ $7.00	☐ $7.00	☐ $9.00	$
SATURDAY, APRIL 25, 1981 LADIES' CONTINENTAL BREAKFAST	.....	.....	.....	.....	☐ $4.00	.....	$
SATURDAY, APRIL 25, 1981 AWARDS BANQUET RECEPTION AND AWARDS BANQUET	☐ $25.00	☐ $40.00	☐ $20.00	☐ $35.00	☐ $25.00	☐ $40.00	$
SUNDAY, APRIL 26, 1981 DIEHARDS BRUNCH	☐ $7.00	☐ $12.00	☐ $5.00	☐ $10.00	☐ $7.00	☐ $12.00	$
COCKTAIL TICKETS, EACH	☐ $2.25	☐ $2.25	☐ $2.25	☐ $2.25	☐ $2.25	☐ $2.25	.....
BOOK OF EIGHT TICKETS	☐ $18.00	☐ $18.00	☐ $18.00	☐ $18.00	☐ $18.00	☐ $18.00	$
TOTAL	$	$	$	$	$	$	$

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NOTE: "Military Member" Fees apply to active U.S. Army, Retired, Reserve Component, and DAC personnel, except those retired, Reserve Component, or retired DAC in the employ of defense contractors or suppliers who are to register and attend functions at the "Civilian Member" rate. Please make checks payable to "AAAA."

*INCLUDES $15.00 First-Year AAAA Membership Dues with the New Member Registrant to then pay the appropriate Military Member or Civilian Member "Function Fees" shown in the table. Please return your Registration Form and check to: AAAA, 1 Crestwood Road, Westport, CT 06880.

THE 23RD AAAA NATIONAL CONVENTION

Shoreham Hotel, Washington, D.C.—23-26 April

1981 PROFESSIONAL-SOCIAL PROGRAM

THURSDAY, 23 APRIL

1430—1630
AAAA NAT'L BOARD MEETING
1630—1715
SCHOLARSHIP FOUNDATION MEETING
1800—2100
EARLY BIRDS' RECEPTION/SAIGON SOIREE
2100—2400
CLOUD 9—CHAPTER HOSPITALITY SUITES

FRIDAY, 24 APRIL

0930—1100
AAAA GENERAL MEMBERSHIP MEETING
1100—1200
PRE-LUNCHEON REFRESHMENTS
1200—1330
AAAA SWEEPSTAKES AWARDS LUNCHEON
1330—1335
WELCOME TO PROFESSIONAL PROGRAM
1335—1400
KEYNOTE SPEAKER
1400—1500
INDUSTRY PRESENTATIONS
1500—1600
REFRESHMENTS—INDUSTRY DISPLAY AREA
1600—1630
INDUSTRY PRESENTATIONS
1630—1700
INDUSTRY PANEL—Q. AND A.
1715—1815
1981 CUB CLUB REUNION
1900—2030
THE PRESIDENT'S RECEPTION
2200—0100
CLOUD 9—CHAPTER HOSPITALITY SUITES

SATURDAY, 25 APRIL

0800—0830
USAREUR AVIATION
0830—0900
AVIATION MATERIEL READINESS
0900—0930
QUESTIONS AND ANSWERS
0930—1030
REFRESHMENTS—INDUSTRY DISPLAY AREA
1030—1050
GUEST SPEAKER—DA SECRETARIAT
1050—1110
ARMY NATIONAL GUARD AVIATION REPORT
1110—1130
USAR AVIATION REPORT
1130—1300
INFORMAL AAAA LUNCHEON
1300—1330
US ARMY AVIATION CENTER OVERVIEW
1330—1400
AVIATION PERSONNEL UPDATE
1400—1430
QUESTIONS AND ANSWERS
1430—1500
ACAB TEST IN 9TH INFANTRY DIVISION
1500—1530
QUESTIONS AND ANSWERS
1530—1730
REFRESHMENTS—INDUSTRY DISPLAY AREA
1850—1950
NATIONAL AWARDS BANQUET RECEPTION
1950—2200
1981 AAAA NATIONAL AWARDS BANQUET
2200—0100
CLOUD 9—CHAPTER HOSPITALITY SUITES

SUNDAY, 26 APRIL

1000—1100
AAAA NAT'L BOARD MEETING
1100—1430
AAAA DIEHARDS' GETAWAY BRUNCH

Gunners aboard U.S. Army Cobra attack helicopters will be able to fire TOW antitank missiles, cannon rounds, and rockets with unprecedented precision, thanks to a telescopic sight equipped with a mini-laser rangefinder. The sight, called the Laser Augmented Airborne TOW (LAAT), determines a target's range based on the time it takes a laser burst to reach the target and bounce back.

This data is fed to the Cobra's fire control computer with information on wind and ammunition ballistics. Hughes delivered the first production LAAT system on schedule and just 12 months after the go-ahead for delivery of 157 systems.

The TOW antitank guided missile is being improved under a new U.S. Army program. The first step will increase the missile's armor-penetrating capability with a redesigned five-inch-diameter warhead. The second step, called TOW 2, will include a heavier six-inch warhead and a microprocessor-based digital guidance set for increased accuracy and greater flexibility in guidance programming.

The TOW 2's flight motor will be reloaded with an improved propellant for a higher impulse to compensate for the added weight of the warhead and other modifications. Hughes has produced more than 275,000 TOW (Tube-launched, Optically tracked, Wire-guided) missiles for the Army, U.S. Marine Corps, and 32 nations.

Aviation Warrant Officers will soon be managed by their MOS

FROM time to time I have provided and will continue to provide information on aviation personnel business. In this issue, I have some news about the status of our changing direction to Aviation Warrant Officer Management.

For the past few months, the Warrant Officer Division, MILPERCEN, has been reviewing the way it does business. In particular, it is examining how the warrant officer aviators are managed and assigned.

Currently, warrant aviators are basically managed on a geographical basis, i.e., there is a "European" manager for those being considered for a tour in Europe; the assignment manager for Korea is yet someone else; and there are different ones in CONUS for FORSCOM or TRADOC assignments.

This leads to confusion as to who to call for advice on assignments as well as other personnel considerations. To alleviate this situation, warrant officer aviators will soon be managed by their primary MOS.

Therefore, an attack pilot (100E), for example, will be able to telephone or write one person (that person being of the same MOS), regardless of where he is currently located, and receive information regarding assignments or other concerns.

Within the next few weeks, MILPERCEN will send a letter to each warrant officer aviator advising him of this change and who his new career manager will be. A great deal of work and planning have been done to effect a smooth transition; however, as with any change, there will be bugs to iron out. So long as everyone works together during the transition period, the end result should be a better managed Corps.

We have just completed another good year for Army Aviation in 1980. Many aviation contributions have been in remote parts of the world as part of combined arms operations; more **Black Hawks** were fielded; and developmental programs such as the **Advanced Attack Helicopter (AAH)** and CH-47 Modernization have moved forward.

Let's face 1981 with renewed vigor and dedication to make Army Aviation even a more valuable part of the Army — with careful consideration of mission accomplishment and taking care of our personnel and managing our resources efficiently.

Happy New Year! □

By BG Richard D. Kenyon
Army Aviation Officer, DA

Survey after survey of AWOs leaving the service indicate that flight pay inequity is the number one cause of low retention . .

The answer is obvious! Equalize flight pay.

IN recent discussions concerning the equalization of **Aviation Career Incentive Pay (ACIP)**, we became more convinced than ever that equalization, or rather the lack of it, is a major factor in aviator retention within the Army and that the **Army Aviation Association (AAAA)**, and this magazine, which has its endorsement, should continue to support all efforts to achieve incentive pay equalization for Aviation Warrant Officers (AWOs).

The topical charts and narrative that follow were derived from an Army staff briefing presented on December 8, 1980, to the Deputy Assistant Secretary of Defense for Military Personnel Policy, and are furnished to keep our readers advised of developments within this area.

Requirements

In looking at Army Aviation strength today we note that the October 1, 1980, **active aviation profile** for O5 and below was:

Total AWO Requirements	6,301
Total AWO Inventory	5,409
AWO Status	—892
Total Comm Off Requirements	5,164
Total Comm Off Inventory	6,113
Commissioned Officer Status	+949
Overall Aviator Status	+57

In projecting **inventory profiles** to 1987, the following results occur:

Field Grade SC15 Authorization and Inventory Profile

Year	Inventory	Authoriz.	Difference
81	2745	1219	+1526
83	2571	1192	+1379
85	2312	1238	+1074
87	1905	1248	+657

Company Grade SC15 Authorization and Inventory Profile

Year	Inventory	Authoriz.	Difference
81	1888	2570	—682
83	2138	2727	—588
85	2385	2677	—381
87	2678	2785	—107

Aviation Warrant Officer Authorization and Inventory Profile

Year	Inventory	Authoriz.	Difference
81	5409	6301	—892
83	5731	6433	—702
85	5883	6624	—741
87	6028	6818	—790

Pay disparity

The Aviation Career Incentive Act of 1974 had two main purposes: first, to provide incen-

(ACIP/Continued on Page 12)

Top-ranked for reliability!

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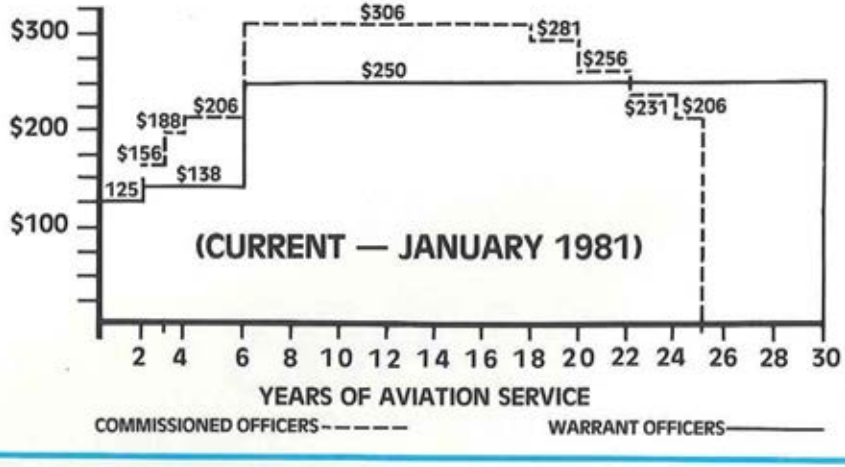
CHART 1

AVIATION CAREER INCENTIVE PAY AWO VS COMMISSIONED OFFICER



ACIP

(Continued from Page 10)

tive for aviators to fly and, second, to encourage aviators to stay in the Armed Services as a career.

Viewing today's **Aviation Career Incentive Pay (ACIP)** as shown in **Chart 1**, one notes the 30-year pay disparity.

Key duties

The key responsibilities played by aviation warrant officers in units indicates the significant role the AWO plays in the Army's aviation business.

Aviation Warrant Officers assume the following roles in the day-to-day activities within Army Aviation:

Instrument Examiner, Safety Officer, Instructor Pilot, Maintenance Officer, Standardization Officer, Section Leader, Pilot in Command, Team Leader, and Platoon Commander.

In looking at **Aviator Retention at the End of the Obligation** one notes the following:

FY Year	End of 1st Yr of AD	End of 2d Yr of AD	End of 3d Yr of AD
73	93.96	87.40	66.40
74	99.45	96.20	60.16
75	100.00	99.47	65.62
76	99.61	96.52	45.17
77	98.37	91.05	47.15

The foregoing shows that aviators trained in FY's 73, 74, and 75 had a retention rate in excess of 60%, and it also shows AA's trained in FY 76 and FY 77 being retained at lesser percentages, i.e., 45% and 47% respectively.

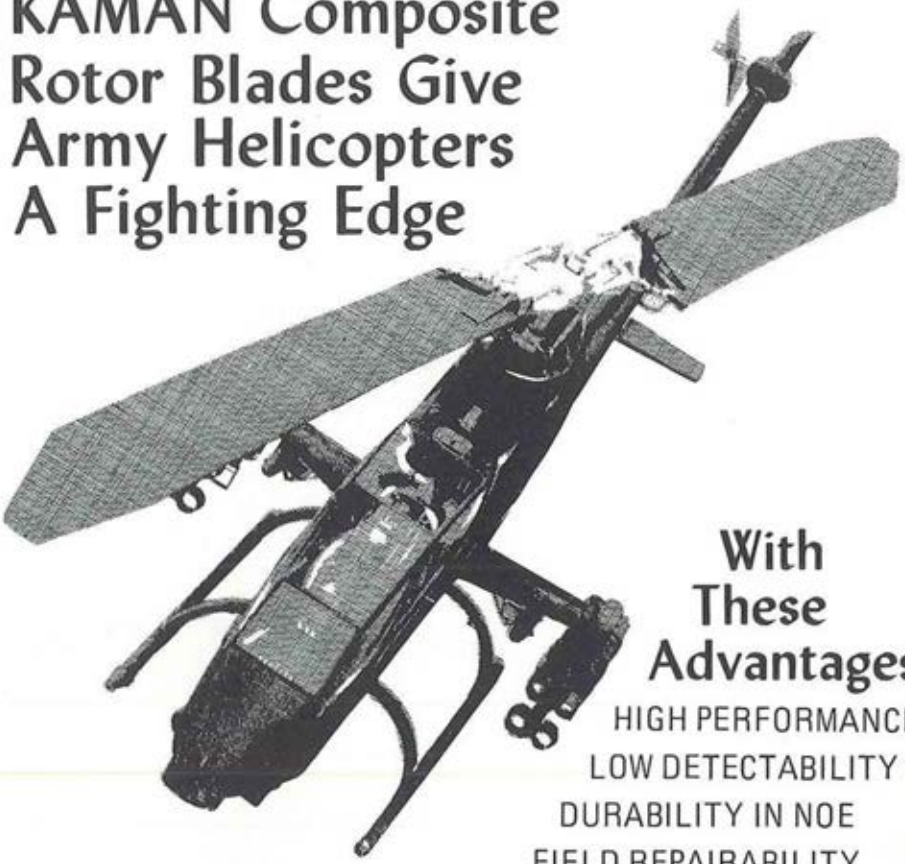
In looking at **Total Aviation Warrant Officer Service upon Release from Active Duty**, the statistics are these:

Years of Service	Fiscal Year 1978	Fiscal Year 1979	Fiscal Year 1980
0-3	76	185	225
3-6	58	59	48
6-10	82	125	85
10-15	2	7	18
15-20	0	0	0
Total	218	376	376

(ACIP/Continued on Page 64)

USA TSARCOM Special Report

KAMAN Composite Rotor Blades Give Army Helicopters A Fighting Edge



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TSARCOM: THE SEAT OF AVIATION READINESS

As the Department of the Army Aviation Officer, Brigadier General Richard D. Kenyon recognizes the diverse responsibilities of TSARCOM and calls the readers' attention to the Command's major role in driving the logistics system that keeps us flying

IT takes a great deal of effort to budget for and procure new items in the Army, not to mention provisioning, distribution, repair, overhaul, and coordination for disposal. The U.S. **Troop Support and Aviation Materiel Readiness Command (TSARCOM)** does all these functions for troop support and aviation equipment on an international scale.

For those of you who thought that TSARCOM only supports only aviation materiel, it may surprise you to learn that they also handle a diverse array of equipment which includes water craft, generators, bridges, water purifiers, air conditioners, compasses, surveying instruments, and even horses and dogs.

They keep us flying!

Paramount in the eyes of most of us in Army Aviation, of course, is their function in the arena of aviation equipment. TSARCOM manages the resources and materiel which drive the logistics system that keeps us flying. As such, TSARCOM is directly concerned with materiel readiness.

Just think of the Commander of TSARCOM in his aviation role as the Maintenance Officer of all Army Aviation. That's quite a far reaching charter!

TSARCOM manages the readiness of some 8,700 aircaft ranging in density from over 3,800 UH-1 helicopters to as few as two U-1's, two U-9's, and three U-10 airplanes.

It accomplishes this by having all levels of management applied to aircraft systems including Project Managers, Product Managers, Readiness Project Officers, and Commodity Managers.

A major factor in safety

In addition to having a safety function as the originator of all safety of flight messages for all aircraft, TSARCOM has reacted to unusual, unforecast and complex aviation requirements worldwide in the past year. Through competent efforts and hard work, TSARCOM has continuously been a major factor in laudatory aviation safety records, high operational readiness rates, and overall sound logistics management. On behalf of the entire aviation community, I convey our sincere thanks for a job well done! □

ASE PROVIDES SNAKE PROTECTION

Even a deadly killer like the AH-1S Cobra needs protection! Designed with the Cobra in mind, Sanders' AN/ALQ-144 Countermeasures Set provides the protection needed against IR heat-seeking missiles. The AN/ALQ-144 means aircraft survivability resulting in increased combat effectiveness!

The AN/ALQ-144 features proven high reliability and simple maintenance, and is suitable for worldwide deployment.

The fully flight-qualified AN/ALQ-144 system and its special test equipment are currently in production and are available on order.

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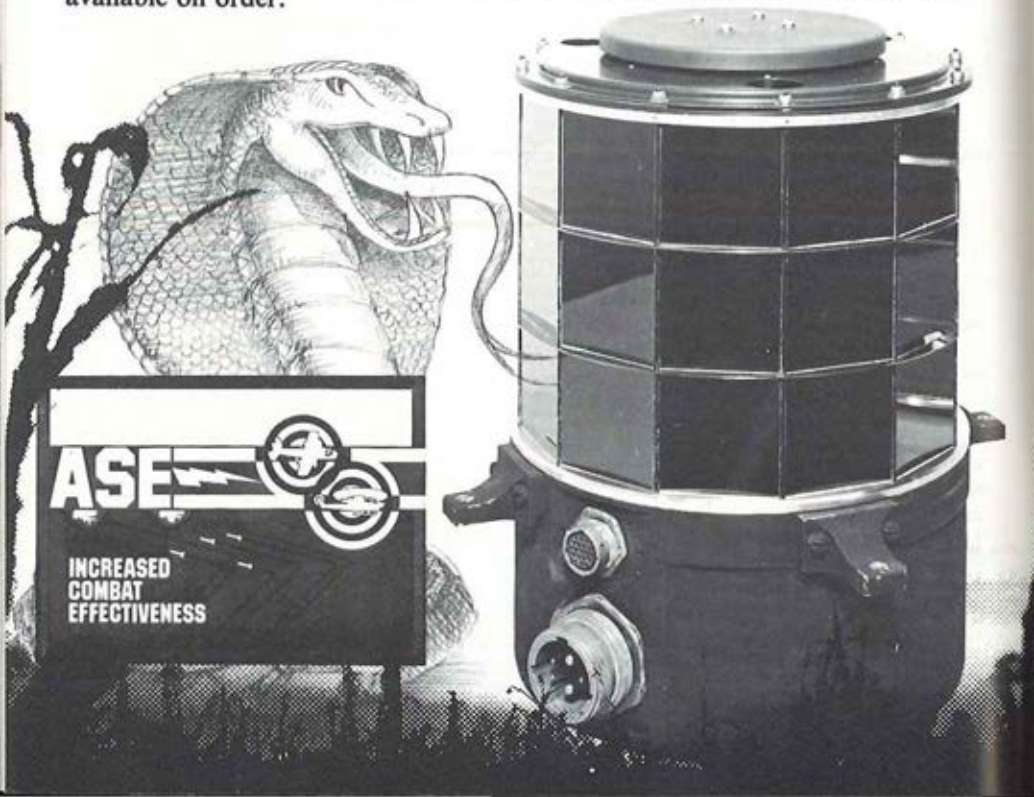
For further information on the AN/ALQ-144 or other Sanders systems for fixed and rotary wing aircraft, contact:

Defensive Systems Division
95 Canal Street, Nashua, NH 03061
ATTN: MER 12-1125 (603)885-3583



TSARCOM: A TOTAL SYSTEM FOR AVIATION SUPPORT

With a depot inventory valued at $2.4 billion, TSARCOM is undoubtedly "big business," says MG Emil L. Konopnicki, its commander, but it's also the Army's highly specialized, ever responsive key to aviation readiness demands

TSARCOM proudly presents its Aviation Support story to you in this special issue of **Army Aviation. We are one of 15 major subordinate Commands that report to the U.S. Army Materiel Development and Readiness Command (DARCOM)** which, in turn, reports to the Department of the Army.

We have also earned a reputation for being a Readiness Command most responsive to the field soldiers' needs.

It is our mission to provide the best possible aviation logistics readiness support to our Army. Additionally, we support ongoing logistics efforts in over 50 foreign nations.

TSARCOM is people — 5,000 of them. Approximately 260 are military, so you see our Command is primarily a civilian workforce. These same people are committed to you for they represent the Army's interest in materiel readiness.

TSARCOM uses three level management concept: Project and Product Managers, Readiness Project Officers, and Materiel Managers.

The first level, Project and Product Managers, are given the Commander's full authority and, as such, are responsible for a specific system requiring intensive centralized management. The **Cobra** and **Special Electronics Mission Aircraft (SEMA)** PMs are our aviation-related first line managers.

Of TSARCOM's 12 second level **Readiness Project Officers (RPO)**, five are aviation-related. These designated individuals function much like mini-project managers. They are chartered by the TSARCOM Commander to lead small, hard hitting Task Forces to cope with the your readiness problems in the field. Indeed, the RPO takes responsibility for his system within the TSARCOM community and provides TSARCOM's single face to the field.

Materiel Managers and Item Managers reporting to our Directorate for Materiel Management constitute the third level of management. These people operate similarly to PMs and RPOs for specific systems, but with somewhat less authority. These 233 managers are the backbone of our wholesale supply effort.

TSARCOM is "big business." Our Materiel Management Directorate alone manages a depot inventory of over 60,000 line items of supply valued at $2.4 billion. We process over 600,000 requisitions annually.

More aircraft than USAF

We have over 9,000 aircraft in our inventory, a total that exceeds that of our own U.S. Air Force. We fund programs of $1.6 billion, have a depot inventory of repair parts and major items valued at over $2 billion, manage over $291 million in foreign military sales, and receive and process over $1 billion in requisitions annually.

Impressive?

Yes, but all of these statistics are secondary to our concern for you in Army Aviation.

In the following pages of this special issue of **Army Aviation Magazine**, we're pleased to describe some of the many undertakings that are happening at TSARCOM. Indeed, we consider ourselves the key to responsive reaction to your readiness demands. □

The Commanders' Edge . . . Attack Day or Night

The U.S. Army's Advanced Attack Helicopter, the Hughes AH-64A is designed to fight and survive on the battlefield day, night and in adverse weather.

Fulfilling all program objectives the AH-64A has:

- Fired Hellfire missiles.
- Demonstrated Fire Control System capability.
- Integrated the TADS/PNVS System.
- Fired the 30mm CHAIN GUN and rockets.
- Operated the Helmet sight (IHADSS) with all weapons systems.
- Demonstrated night NOE flight ability.

All flight envelopes and survivability requirements have been met or exceeded.

The U.S. Army-Hughes AH-64A — Proven, tested and ready for production. Hughes Helicopters, Culver City, California 90230, USA.

A Total System for Battle

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WHY READINESS PROJECT OFFICERS?

"The RPO concept provides the best of worlds," says key aviation logistician Joseph P. Cribbins. "They provide the knowledge necessary to manage complex and expensive systems without infringing on the responsibilities of those with whom they work."

THERE is quite a history associated with the **Readiness Project Officers (RPO)** at TSARCOM. To some degree the RPO is an outgrowth of the **Aviation Logistics Support Officer (ALSO)** in the Aviation Logistics Office, Office Deputy Chief of Staff for Logistics in the Pentagon established in 1967 by General Abrams, then Vice Chief of Staff.

During the period 1967-1973, when Vietnam was going full tilt, the Aviation Logistics Ofice had an ALSO for each major aviation system. The ALSO's responsibilities involved monitoring assigned systems and developing all of the information and data needed to keep track of the location and status of each aircraft.

Multi-level interface

In addition, the ALSO had to interface with other agencies on the Army Staff, the Secretariat in the Army and Office Secretary of Defense, DARCOM and its supporting commands, other major commands worldwide, the other services, and industry.

It was the ALSO's job to be able to pinpoint what was needed to have each aircraft ready as a total weapons system. With the windup of Vietnam and the staff reduction in the Aviation Logistics Office in 1973, it appeared that there might be a serious vacuum in the readiness knowledge provided by the ALSO's. Thanks to the RPO, this hasn't happened. Here's how the RPO concept works:

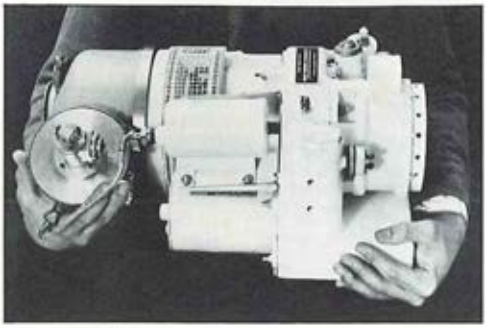
Logistics in the Army is generally organized along functional lines, e.g., supply, maintenance, transportation, etc. The Project Managers are an exception, since they manage all the functions for their assigned weapons system or commodity. The RPO's straddle these two management concepts and fill a badly needed requirement. They interface with the functional managers, with DARCOM and DARCOM Commands, with DLA and GSA, with the Army Staff and other services, and with industry.

They provide the knowledge necessary to manage complex and expensive systems without infringing on the responsibilities of those with whom they work. As team leaders for their assigned systems/commodities, they conduct the annual **World Wide Aviation Logistics Conference.** They respond to such diverse questions as aircraft readiness, availability of spare parts, distribution, and location of aircraft by serial number, Safety-of-Flight modifications, loan, lease, or disposal of aircraft and many more.

When TSARCOM was formed from elements of the Aviation Systems Command (AVSCOM) and the Troop Support Command (TROSCOM), there was concern that management and support of **Aviation** would suffer. **This has not happened.** Conversely, management of Troop Support materiel has improved. The RPO has played a part in this, since there are now RPO's for Troop Support items and systems as well as **Aviation.**

The RPO concept provides the best of all worlds: the real time information and data needed for intensive management and support for Army Aviation world wide without the necessity to reorganize or restructure the Army to attain this goal.

Isn't it about time small helicopters got the same break the Titan APU gives the bigger guys?



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TSARCOM'S KEY CONTACT IN THE FIELD: THE AVIATION RPO

The Readiness Project Officer's assignment, according to Colonel Jon R. Telfer, lends continuity to project management on a sustained basis, and is considered as "dynamic, ever-changing, and challenging."

WHAT is an RPO? Well, for starters, let me tell you what the TSARCOM **Readiness Project Officer (RPO)** isn't . . . he's not a **Project Manager (PM)**.

There is a difference between an aviation Project Manager and an aviation Readiness Project Officer.

The Project Manager is normally chartered by Department of the Army as the manager of a system in development or in production where special management is required, and possesses broader responsibility and authority than the RPO. The PM's basic mission is to get an aircraft system ready for field use as rapidly as possible.

Continued intensive management

The Readiness Project Officer is the executive chartered by the Commanding General, TSARCOM who is responsible for managing a system — such as the C-12, OH-58C, or UH-1 — where continued intensive management is required. In this role, he is primarily responsible for the readiness of the system.

There are several areas of overlap since the RPO is also involved in the development and testing of an aircraft system which may have been previously fielded but which may also have been modified extensively through a **Product Improvement Program (PIP)**. A good example of this is the conversion of the OH-58A **Kiowa** to the OH-58C, a configuration which is totally RPO managed.

The most important function of the Readiness Project Officer, insofar as the "user" is concerned, is to provide a responsive single point of contact to answer questions, solve problems, and keep mission capability as high as possible.

How does the RPO do this?

Under his charter the Readiness Project Officer exercises centralized "birth-to-retirement" management of his system(s). This includes full command authority and responsibility for intensive care of each system, which is accomplished through a proven concept, that of the **System Management Team.**

A team of experts

Each RPO has a team of functional directorate experts on orders from Maintenance, Materiel Management, Product Assurance, and Procurement and Production. Under his direct authority these and other personnel perform the daily "doer" functions for the system relative to their field without specific RPO direction while the RPO, as the manager responsible for the overall system, keeps the system on track only interjecting himself as required in response to user requirements and/or problems.

The "user" is not a nebulous figment of the imagination who is not defined. For some systems the **Training and Doctrine Command (TRADOC)** maintains a **TRADOC System Manager (TSM)** who is the "user" representative and single official point of RPO contact for user requirements on the system. In other cases, TRADOC Schools and Centers provide this coordination.

The RPO also controls and directs the execution of approved funding programs and insures preparation of the **Product Improvement Management In-**

Information Report (PRIMIR) which lays out the dollar requirements and schedules for modifications to the system. The PRIMIRs are reviewed and approved annually by Department the Army.

Another major function of the RPO is the identification of potential problems — before they become actual problems. He does this by tasking TSARCOM functional directorates for **Quality Deficiency Report (QDR)** and **Equipment Improvement Recommendation (EIR)** data which is reviewed continuously.

He also maintains constant watch on the status of potential **Not Mission Capable Maintenance (NMCM)** problems and **Not Mission Capable Supply (NMCS)** items which may develop into maintenance/materiel problems or critical safety concerns if not corrected.

Another vehicle in which the Readiness Project Officer is deeply involved is the **TSARCOM Safety of Flight Review Committee (TASSFRC)**. The committee, chaired by the Director of Systems Management, has all TSARCOM major directors and representatives of the **United States Army Safety Center (USASC)** as members.

Its function is to serve as the vehicle to aid in the identification of potential safety problems and to assist the RPO in expediting solutions. The TSARCOM Commander reviews all actions of this committee.

Each May, the **Worldwide Aviation Logistics Conference (WALC)** is hosted by the Director of Systems Management in St. Louis. The RPO must account for the exact location of all his aircraft and plan for future movements after DA/MACOM coordination.

The RPO's job is dynamic, visible, ever-changing, and challenging. For future Project Managers the job provides the best practical PM training possible. □

ABOUT THE AUTHOR

COLONEL JON R. TELFER, THE TSARCOM DIRECTOR OF THE SYSTEMS MANAGEMENT DIRECTOR, IS A SENIOR AVIATOR WITH OVER 23 YEARS OF ACTIVE DUTY INCLUDING TWO TOURS IN VIETNAM. A 1967 C&GCS GRADUATE, HE SERVED AS AN ODCSLOG STAFF OFFICER IN HQDA DURING 1969-1973.

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ELECTRONIC AIRPLANES WORLDWIDE: SEMA UPDATE

In fulfilling vital military intelligences role by providing necessary peacetime surveillance, today's Special Electronics Mission Aircraft are involved in the four significant program areas, according to SEMA-PM Colonel "Sy" Berdux

DURING peacetime or wartime the missions and responsibilities of the **Special Electronics Mission Aircraft (SEMA) Product Manager's (PM)** Office are substantially the same. Under either condition SEMA is a prototype of perpetual motion.

This article provides some insight into the scope and complexity of the ever ongoing activities encompassed in the SEMA mission, responsibilities, and near-time future events.

Constant: Real-time intelligence

The SEMA fleet provides the commander with the airborne capability of surveying the tactical posture of friendly and opposing forces in his area of interest. This real-time intelligence serves critical needs of the field commander in both peace and war. Unlike most military systems, which are in stand-down or training missions during peacetime, the SEMA are always actively engaged in their primary military intelligence role, and during peacetime provide an additional supporting role for various government agencies.

The PM for Special Electronics Mission Aircraft is responsible for the management of manned airborne signal intelligence, electronic warfare, and electronic and photographic surveillence programs.

This includes exercising the full line authority of the **Commanding General (CG)** of the United States Army **Materiel Development and Readiness Command (DARCOM)** for centralized management; and includes all planning, direction, coordination, and control of tasks and resources for integration of sophisticated electrical warfare systems into airborne platforms. The Project Manager is also responsible for materiel readiness of the fielded fleets, which have many series and models of both fixed wing and rotary wing aircraft.

Intensified management of SEMA programs began in February, 1976, when the charter for the Product Manager was approved by CG, DARCOM. The office was organized and assigned to the U.S. Army **Troop Support and Aviation Materiel Readiness Command** ; and since then the SEMA list of programs has grown from three to a high of 17 different programs.

Widespread expertise provided

These programs vary in scope and complexity from systems in concept formulation, such as SEMA-X aircraft for the 1990's to systems disposal, such as **Winebottle** and the RU-8 currently in the phase-out process. However, since SEMA encompasses many varied technical disciplines, significant support expertise is provided from several DOD commands and other government agencies.

The signal intelligence and electronic warfare hardware expertise is provided by the **Signal Warfare Laboratories (SWL)** and **Electronic Warfare Laboratories (EWL)**, while surveillance expertise is provided by the Combat Surveillance and Target Acquisition Laboratories.

These laboratories are all subordinate to U.S. Army Electronic Research and Development Command. Mission equipment logistical support is coordinated and supported by the U.S. Army Communications and Electronic Readiness Command.

SEMA UPDATE
(Continued from Page 25)

Aviation logistical support is provided by TSARCOM and aircraft survivability equipment and aircraft engineering support are obtained from the USA **Aviation Research and Development Command (AVRADCOM).**

A U.S. Army **Training and Doctrine Command (TRADOC) Systems Management Office (TSM)** for SEMA systems was offically established on 10 September 1980. Prior to that time, TRADOC proponency for SEMA systems had been managed for the user by the Intelligence School.

The mission of the TRADOC Systems Manager is to insure that all of the TRADOC requirements are met when a SEMA system is fielded, especially in the critical areas of training, personnel, logistics and materiel development, and to insure that these requirements are fully integrated within the functional responsibilities of the Intelligence School and other Schools and Centers as appropriate.

Four major programs

SEMA has four significant program areas: The familiar OV-1 **Mohawk** (below), with its cameras, infrared, and sidelooking radar systems, is still the backbone of the Army's surveillance systems. Currently, we are in the process of completing testing on the AN/UPD-7 surveillance system with an improved AN/APS-94F radar, a new data link, and an improved ground station. This system will replace the fielded AN/APS-94E.

Evaluation of a new capability for the **Mohawk** fleet was directed in a Program Decision Memorandum of August, 1979, which may equip the aircraft with an **electronic scan capability (ESCAN).** A feasibility study is underway and a decision is pending as to whether the Army should place this capability on the aircraft. The ESCAN will provide a quantum jump in technology and performmance for the radar surveillance system.

Another derivative of the **Mohawk** is the RV-1D **Quick Look** System (photo, opposite page), which provides real-time intelligence on radar emitters through its own array of airborne and ground based facilities. System III of **Quick Look** will be fielded to **Forces Command** (FORSCOM) in mid-FY 81.

New system fieldings

In the **Guardrail** Program (photo, opposite page), the SEMA PMO and its supporting agencies recently accomplished the fielding of the third system of **Guardrail V,** complete with RU-21H aircraft and ground facilities, one and one-half months ahead of schedule, thereby maintainng a perfect record of new system fieldings on or ahead of schedule since the office was established. SEMA is also responsible for fielding of all its systems and provides recommendations upon request for a host of projects which are still in the "what if" stage.

We are now working diligently toward contract award of the new generation **Improved Guardrail System** in Spring 1981. This contract includes going to the new RC-12D aircraft and will provide an increased mission package capability for a more responsive intelligence

The U.S. Army OV-1D Mohawk Surveillance System

product to the Field Commander. Going to the RC-12D will solve the problem of operating aircraft at high altitude in a non-pressurized cockpit environment.

Mohawk, Quick Look, and **Guardrail** Systems evolution will not stop there because technology and the threat will continue to evolve. We are already looking into future generations of systems aimed at reducing the number of airborne platforms to accomplish the total electronic mission, as well as expanded interoperability with the total intelligence community.

Additional peacetime missions include support to Bureau of Customs, U.S. Coast Guard, Environmental Protection Agency, Forestry Department, the U.S. Army Corps of Engineers, and the National Aeronautics and Space Administration.

Division level support

The systems discussed previously have all been Corps level systems. We are also involved in supporting the Division commanders directly. The **Quick Fix** Program (see photo on page 28) consists of a heliborne signal intercepting and jamming system, and four different **Quick Fix** Systems are involved.

Quick Fix 1A (an EH-1H) is fielded in CONUS with FORSCOM units and is actively used in daily training and plays a major role in the U.S. Army Readiness Command sponsored joint exercises in CONUS, and **REFORGER** in Europe.

Quick Fix 1B (EH-1H) began operational testing 25 September 1980 at Fort Huachuca, AZ, and is scheduled for fielding shortly. The

RV-1D QUICK LOOK II SYSTEM

RU-21H GUARDRAIL IV

primary equipment improvement is a better jammer capability gained by replacing the AN/TLQ-27A with the AN/TLQ-17A.

The EH-1X aircraft for the **Quick Fix IIA** Program are currently undergoing airframe modification and drawing validation at Corpus Christi, TX, Army Depot prior to being sent to the National Guard at Fresno, CA, for installation of mission equipment, testing, and subsequent follow-on evaluation.

The Army awarded a $15 million contract on 29 September 1980 for the prototyping effort on the **Quick Fix IIB** (YEH-60A). This next step will have a derivative of the **Black Hawk** as the airborne platform. The engineering estimates show the EH-60A will have a 96% to 99% commonality with the UH-60A. The changes to the aircraft will be minimal and consist mainly of installation of peculiar wiring and new antennas. The EH-60A will retain all survivability, reliability, availability, and maintainability improvements of the basic **Black Hawk** helicopter.

Examples of SEMA programs having more maturity are **Left Jab** and **Cefrim Leader.** The JU-21A **Left Jab** is a manned airborne communications Radio Direction Finding System developed in the early 1970's. It is distinguished by a large teardrop shaped pod that is extended below the aircraft in flight. These aircraft are assigned to the Reserve Components.

The AN/TLQ-11 Countermeasurers System, commonly known as **Cefrim Leader,** is a unique electronic mission system providing airborne intercept, radio direction finding, and electronic countermeasures support to Army combat forces.

The EH-60A Quick Fix Electronic Warfare System

SEMA UPDATE
(Continued from Page 27)

Various elements of the system are divided among three different aircraft configurations. RU-21A aircraft are configured for intercept and direction finding, and relay of hostile emitter locations to supported commands on the ground. The RU-21B aircraft provide command and control of the other aircraft in the system, and the RU-21C aircraft provide the jamming capability.

This system is currently being upgraded by rotating the aircraft through Beech Aircraft Corporation to incorporate 15 engineering changes which enhance safety and improve operational reliability.

The biggest responsibility

Field materiel readiness is the biggest responsibility of the SEMA Product Management Office. We insure that the systems are supportable and we coordinate the procurement, distribution, and training, together with providing logistical support, to include dispatching of special purpose teams to assist in solving peculiar field and mission equipment problems. Since SEMA was formed, ten systems have been fielded and another 11 systems are scheduled to be fielded through 1982.

ABOUT THE AUTHOR

COLONEL SYLVESTER C. BERDUX, JR., IS THE TSARCOM PRODUCT MANAGER FOR SPECIAL ELECTRONIC MISSION AIRCRAFT (SEMA). PRIOR TO THIS ASSIGNMENT HE WAS THE ASSISTANT PROJECT MANAGER FOR SPECIAL PROGRAMS IN BLACK HAWK PROJECT MANAGEMENT OFFICE.

The day-to-day maintenance and logistics operations are the responsbility of the **Logistics Management Division**, which consists of eight civilians and four non-commissioned officers. Three NCO's are former crew chiefs on their respective systems, and are well experienced in logistical support. The fourth NCO specializes in the area of Test Maintenance Diagnostic Equipment.

Each SEMA system has its own integrated logistics support management team. This team has representatives from SEMA PMO, commodity commands, and respective contractors, who cover all the logistical aspects of each program for a true system solution to each challenge.

Tailoring a logistic package

As early as three years before a system is fielded, this team begins tailoring a logistic package and hand-off plan to the specific receiving unit. Shortly thereafter, recurring meetings are convened with the user so that the needs and influences of that unit's geographic location, specific mission, and organizational interrelationships can be accommodated in their fielding plan.

Customer support does not cease once the system hand-off is complete. Post deployment ILS teams visit the unit to resolve any unforseen problems and insure complete user satisfaction.

The SEMA team is proud of its involvement in the total force concept having aircraft in the National Guard, the Reserves, and with the Active Army in Germany, Korea, and CONUS. □

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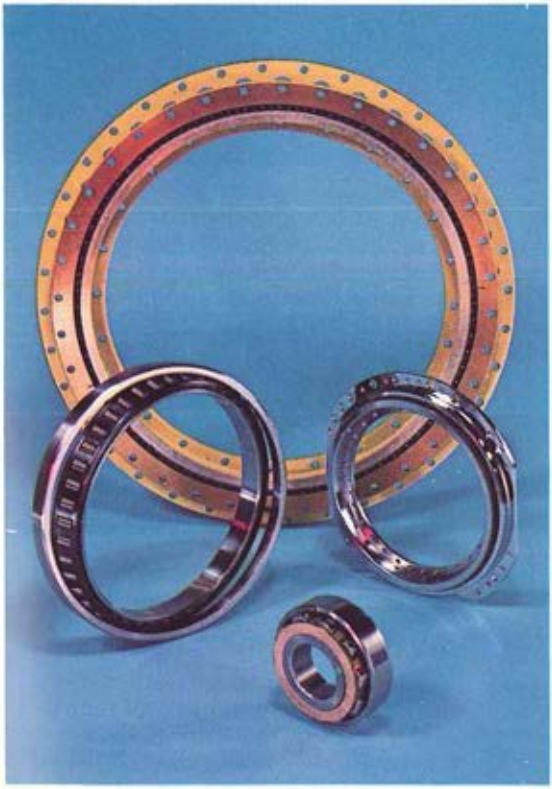

Kaydon is proud to have been selected as a member of the Sikorsky Black Hawk production team.

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You know targets are beyond the skyline. But exactly where? Your forward observer's line of sight is blocked by the high ground. Enemy air defense is too dense for aerial observers.

A proven solution to this age-old problem is taking shape at Lockheed under the direction of AVRADCOM. An RPV—so small it's hard to hit—will fly over the enemy and give you an eagle-eyed view of his forces. It's Aquila, and it will send back over its jam-resistant data link a real-time television picture of the situation on the other side. The Aquila system will interface with TACFIRE and will locate targets for artillery so accurately that you can fire for effect on the first round. If you are firing laser-guided munitions, it will illuminate the targets precisely, using its laser designator.

Think small, think jinking.

Even though enemy air defense may be dense, Aquila's small radar cross section and jinking ability will help it survive while it enables you to observe and adjust fire. Then you will be able to assess damage.

Survivability: the Ft. Bliss tests.

The Aquila program demonstration RPV made a number of flights under fire from several types of weapons. The small, jinking RPV—

on the other side...

it's only 6 feet long and 13 feet wide in wingspan—wasn't hit once. As for infrared seekers, it

The real world. Soldiers flew the Aquila program demonstrator RPV in 150 flights out of a total series of 218.

doesn't generate enough heat for homing.

What else?

As a target locator and designator, this new system will be unmatched. But that's only a beginning. It can be equipped with FLIR for nighttime operations. And the same size and aerodynamic characteristics that enable it to carry its target acquisition payloads also can enable it to handle other missions.

When the other side has more men, more guns, more tanks, you'd better have a force multiplier. That's exactly what this RPV breakthrough in target acquisition is—a force multiplier that will help get steel on target faster, more accurately than ever before. It can be operational in 1984.

Lockheed Aquila

AIRCRAFT REPAIR PARTS: MORE THAN JUST A NUMBER

As the "Keeper of the Keys," Maurice N. Shriber directs and controls the wholesale level inventory of repair parts and says that TSARCOM takes great pride in getting the right item to the right place . . . ASAP!

A primary Department of the Army objective, and indeed its primary peacetime mission, is to maintain a high degree of force readiness. This is a critical prerequisite to wartime mission preparedness.

TSARCOM is involved in almost every facet of materiel readiness of aviation and troop support items. Responsibilities range from the preparation of maintenance manuals and catalogs to the development of training programs, engineering support, and field assistance efforts with TSARCOM being graded on how well it supports its customers — the soldiers in the field.

High on the list

Adequate parts support is high on the list of items contributing to materiel readiness. Stated in its simplest terms, parts support consists of having the right item at the time and place of need. At TSARCOM, the management of aviation spares and repair parts is right at the top of our list of priority programs.

Aviation support is big business. TSARCOM provides total logistics support for over 8,000 rotary wing aircraft, almost 700 fixed wing aircraft, and approximately 400 non-standard aircraft. The Command manages over $2 billion in wholesale level stocks; completes more than 100,000 supply control studies each year; manages over 30,000 stocked-type items; and receives and processes almost 500,000 requisitions annually. TSARCOM's total budget for aviation support runs to almost $400 million per year. It has the second largest stock fund budget and the largest secondary item (spares) program in DARCOM.

TSARCOM takes great pride in its track record concerning adequate parts support for aviation customers. In terms of performance standards directed by higher headquarters, TSARCOM does very well. The reason aviation continues its fine performance is mainly due to the management philosophy of "Solving Tomorrow's Problems Today."

The elusive 85%

The primary performance measure used to gauge the adequacy of TSARCOM's customer support is **Stock Availability (SA)**. This indicator measures the number of requisitions for stocked-type items that are filled immediately from available stock on hand. If the customer requisition is backordered, this counts as an SA deduct. The sustained SA rate for aviation items is good, currently running about 84%. TSARCOM's number one objective is to reach and sustain the elusive 85% target.

When it comes to solving tomorrow's problems today, the item manager is in the driver's seat, backed-up by the TSARCOM team which is very critical. The Materiel Item Manager carries the ball, but he must work with the other Directorates' representatives that make up the team. Procurement, **Directorate for Management Information Systems (DMIS)**, Maintenance, and the Project Manager or Readiness Project Officer are key members.

The item manager must understand and use a number of different indicators and tools to recognize today the problems of tomorrow. He must look in several directions for these indicators. Messages from the field

may be an indicator of a potential problem. The **Commodity Command Standard System (CCSS)** and its products provide yet other indicators. Internal notices designed for a variety of purposes may be an indication of a coming stock availability problem.

TSARCOM has several locally designed programs that indicate or anticipate problems. One of the first signs of tomorrow's problem might be a message from a customer or a TSARCOM Field Maintenance Technician. Information that suggests premature parts failure or failure rates higher than expected is a very good clue. Reports of poor item quality, such as quality deficiency reports or reports of item discrepancy, are also good alerts.

New channels of communication

Recently, the Command established new additional channels of communication with its **Field Maintenance Technicians (FMT's)** and **Logistic Assistance Officers (LAOs)** to allow better and faster feedback of potential customer support problems.

Lagging returns on repairable items are good indicators of a problem on the way. We developed a program in which we use the FMT's extensively in helping us police returns, a program that compares a customer's issues with his returns. If he has a poor return rate, we contact him. We use these reports as a basis to contact the field maintenance technician or the customer and, if necessary, to adjust overhaul and procurement programs.

Increasing administrative lead time is one of our biggest problems. Sensitivity to delays in procurement work directive processing is a must for every manager. Knowing his programmed administrative lead time, he can see the extent of his potential problems and start to solve them.

Abnormal consumption a clue

Reports of abnormal consumption of parts in overhaul programs is a good indicator that a stock shortage may be on the way. Depending on the status of his item, the manager may need to initiate more procurement or to expedite existing procurement.

Over half of our problem items have delinquent contracts which usually indicate immediate stock problems. We find this to be one of the most difficult problems with which to deal. Early knowledge of contract delinquency tells the item manager the size of the problem. However, until the delinquency is resolved, he does not know when he can plan for the production. Depending on his knowledge and history of other producers, the item manager, through the procurement members of his team, may find other sources.

We have a local system that will tell us which items are contributing most adversely to our stock availability. We usually review it weekly, but if there's a drastic change in daily performance, we can get a daily listing. Various backorder lists tell us how much we owe what units, in what quantity, for which weapon system, and for how long.

Supply problems inevitable

The nature of the supply business is such that problems are inevitable. Despite our best efforts to plan ahead, things go wrong and the unpredictable happens. For example, a Safety of Flight occurrence may cause us to replace 40% of the CH-47 transmissions worldwide. Then we have to manage intensively. We are equipped to do that and we have several tools that we use. Let's take a look at some of our most useful products in this area.

Our problem items are consolidated on a "Hit List" which gets Command-wide distribu-

(REPAIR/Continued on Page 38)

A TRUE STORY . .

. . but the names have been changed. A stroke victim in a Berkeley, CA hospital since 1979, who could only communicate "yes" or "no" by blinking his eyes, received an unusual Christmas gift from an area do-good committee.

In true Christmas spirit, it had raised $4,000 and had bought him a small computer with a video screen on which, by activating single keys, he could generate sentences, such as "I'm hungry," etc.

The benefactors huddled around the unfortunate patient as his eyes twinkled. His first message to the do-gooders was "Leave me alone."

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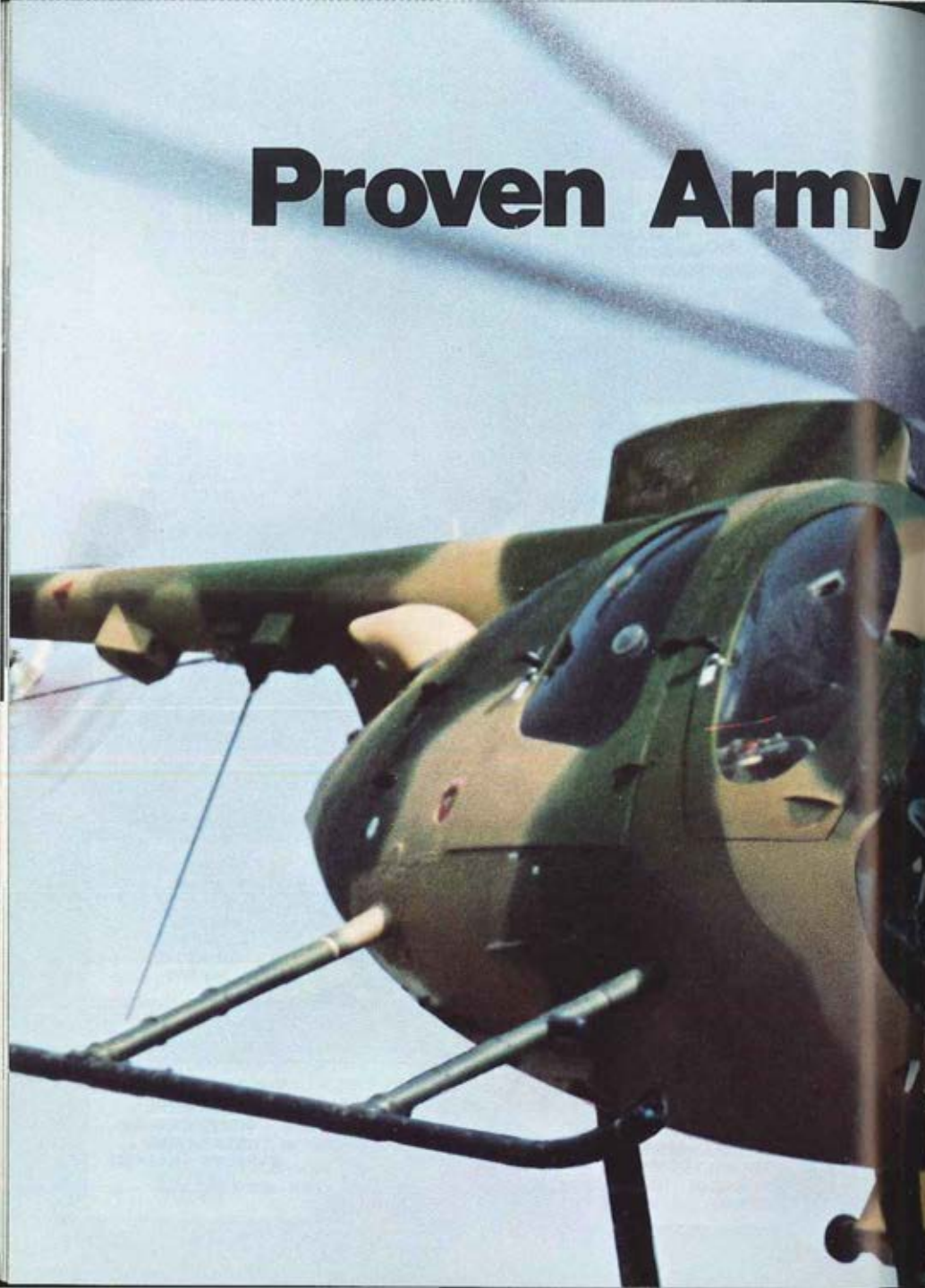
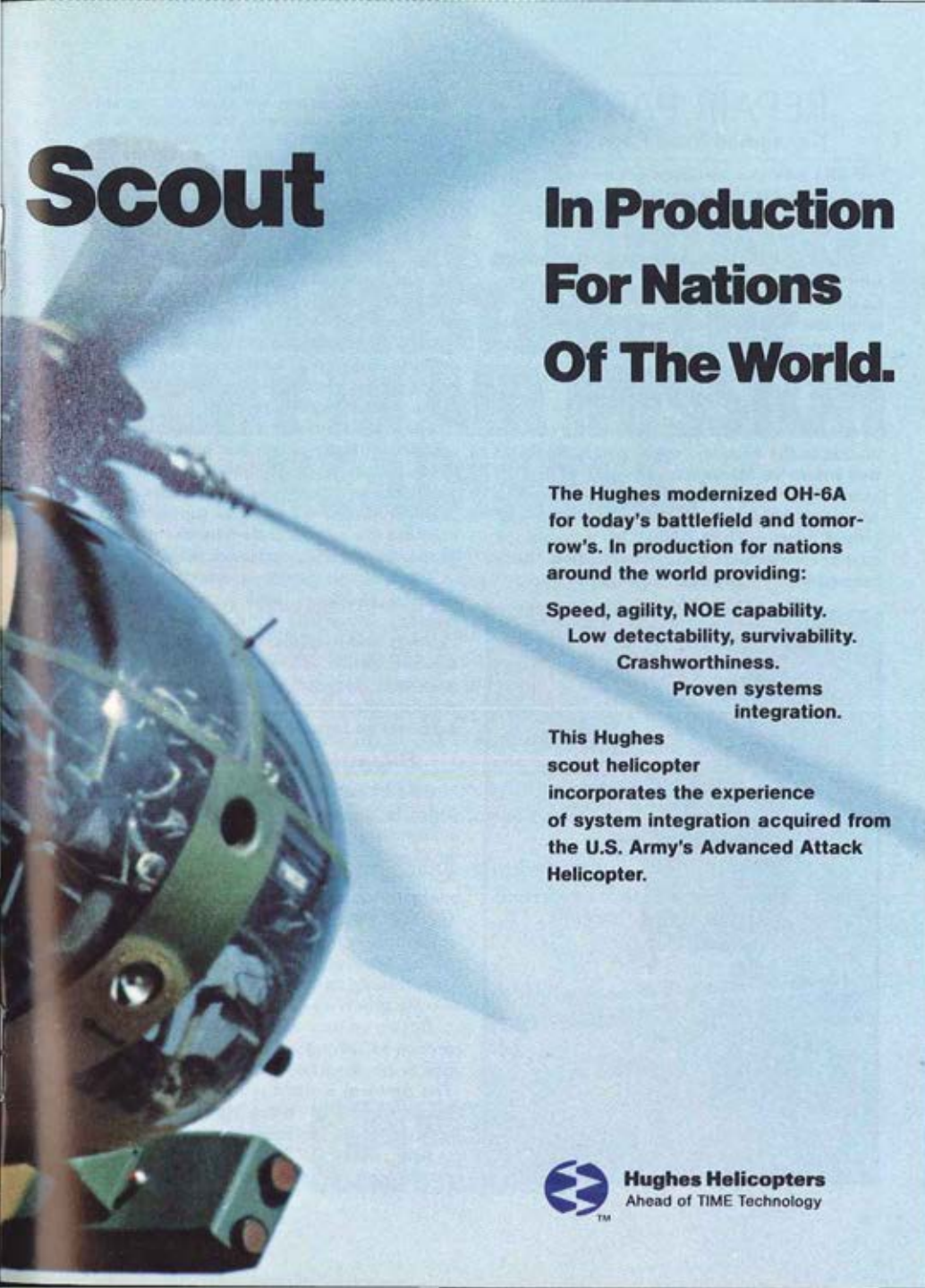
Proven Army





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Speed, agility, NOE capability.
Low detectability, survivability.
Crashworthiness.
Proven systems integration.

This Hughes scout helicopter incorporates the experience of system integration acquired from the U.S. Army's Advanced Attack Helicopter.

Hughes Helicopters
Ahead of TIME Technology

REPAIR PARTS
(Continued from Page 33)

tion and intensive management attention. The items are mainly those that impact stock availability by one-tenth of 1% or have a high number of backorders.

The "Hit List" identifies the Directorate which can get the item in a "well" position. Each Director using the "Hit List" can place emphasis on those items that will do the most to improve stock availability and reduce backorders.

The AIMI Program

Another management program that is most unique to the aviation community is the **Aviation Intensive Management Item (AIMI)** Program. AIMI is a management system used to allocate stocks for higher investment and critical items in short supply. It's a combined customer/materiel management effort that's tailored to the individual customer's needs.

ABOUT THE AUTHOR

MAURICE N. SHRIBER IS THE CHIEF OF THE AIRCRAFT SYSTEMS DIVISION OF THE MATERIEL MANAGEMENT DIRECTORATE. HIS PRIMARY RESPONSIBILITIES ARE TO DIRECT AND CONTROL WHOLESALE LEVEL INVENTORY MANAGEMENT OF SPARES AND REPAIR PARTS IN SUPPORT OF THE ARMY'S FIXED AND ROTARY WING AIRCRAFT SYSTEMS.

The AIMI program serves several needs first and foremost of which is the provision of responsive supply support to the aviation customer. Secondly, it reduces retail level pipeline requirements and saves the taxpayer millions of dollars. Thirdly, it allows the Command's customers to be an active participant in the stock allocation process.

There are a number of external variables associated with the aerospace industry that are adversely affecting our ability to meet commitments to field customers. Lead times and the prices from our commercial suppliers are increasing at a rate faster than those experienced during the oil embargo days of 1974.

Much of this growth is associated with raw material shortages and limited production capacity, especially in the area of critical castings and forgings. In recognition of these adverse trends, TSARCOM is developing a systematic program designed to act on these trends, rather than react to problems as they occur on an item-by-item basis.

Biggest problem? Bearings!

One of our biggest problem areas is **bearings**. To respond, TSARCOM has established a Command task group to develop alternatives to alleviate shortages of this critical commodity. Areas being examined include establishment of additional sources; development of overhaul/repair procedures; identification of minimum/economic order quantities; updating lead times on a generic basis; and establishing an LOB for bearings as a commodity grouping.

As yet, we have not figured out a logical approach to solving all the supply management problems associated with increasing prices. The problem is most severe for the new weapon systems (e.g., **Black Hawk**, Advanced Attack Helicopter) entering the inventory.

The charge to **"Do More With Less"** is a challenging one that must be faced by all. □

HOW HAMILTON STANDARD IS ASSISTING THE ARMY IN AIR MISSION READINESS.

We're helping the Army keep its aircraft safe and ready. A good example is the advanced flight data recorder we've developed for the Black Hawk helicopter (under the sponsorship of AVRADCOM—the U.S. Army Advanced Research Lab at Fort Eustis, Virginia).

Our solid-state, microprocessor-based system logs over 30 important signals, gives digital readout information, "memorizes" selected flight data, and withstands the shock, penetration, crush, severe heat and salt-water immersion of the crash survivability test.

This recorder requires no periodic maintenance and is one-third the cost, weight, and size of current electro-mechanical systems. These advances make it suitable for all types of rotary and fixed-wing aircraft.

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INTEGRATED LOGISTICS SUPPORT AT TSARCOM

Getting new "birds" in the field is one thing, and supporting them once they're in the field is another, according to logistician Al Cook who indicates that post-acceptance actions are many and include Materiel Fielding Plans and Mission Support Plans.

JUST got your new **Black Hawk**? Super, isn't it? We at U.S. Army **Troop Support and Aviation Materiel Readiness Command (TSARCOM)** are proud of the part we play in support of your new bird.

For quite some time many of us at TSARCOM have been heavily involved "making things happen" to assure that you received a logistically supportable mission-ready helicopter.

In numbers, aviation systems or items account for 43 of the 125 programs currently being developed for which TSARCOM will be assigned readiness responsibility, and thereby have the responsibility for logistical support as well.

As the readiness side of the Army Materiel Development and Readiness Command, we've more than a casual interest in fielding good operationally ready systems to forces deployed throughout the world.

To see that all the pieces in the support puzzle fit together prior to system release for issue, we at TSARCOM get together with the developers early, while alternative systems are being studied, so that logistics considerations can be included during the design effort.

This "get together" continues throughout the development and production process and is accomplished through the Integrated Logistic Support Management Team; a group of technical specialists (engineers, supply, maintenance, training, and quality assurance) and others who identify logistics concerns and plan how to achieve full and timely support and fielding for each system under development.

Items required include such things as the basic hardware, maintenance procedures, repair parts, any special tools and test equipment, manuals, changes to facilities (i.e., power or hangers or helipads), operation and maintenance train ing and training materials (simulators, skill performance aids, courses, etc.) and new equipment training for operators and maintenance personnel.

All of these requirements are incorporated into development contracts through data calls conducted in the Command on be-

half of the developer. Involvement continues after the data call through our review of hardware and data produced under the terms of the development contract.

Extensive interaction

Logistics Support Analysis Reviews are conducted as the system emerges — with our best engineers, maintenance, publications, training, supply, and product assurance representatives interacting with the developer and industry.

Information developed from this effort goes into draft operator and maintenance manuals, repair parts and special tool lists, maintenance allocation charts and skill performance aids. These products are tested and validated during the development process and prior to a production decision.

User commands and troops in the field become involved in system support planning when the first draft **Materiel Fielding Plan** and the request for a **Mission Support Plan** are forwarded to them (either two and a half years after the development contract award or three years prior to the scheduled unit employment of the supported system, whichever of the two is later.)

While fielding arrangements and support planning are being coordinated, validation of publications and provisioning actions are underway. Manuals printed, parts in stock and on order, and production copies of the bird all are aimed at joint availability for issue as scheduled.

Our bottom line is the timely issue of affordable and logistically supportable air items to users — appropriately trained and prepared for a high force readiness posture. □

ABOUT THE AUTHOR

ALLEN T. COOK ESTABLISHED THE TSARCOM INTEGRATED LOGISTICS SUPPORT OFFICE AND IS ITS CURRENT CHIEF. HE IS A SUMMA CUM LAUDE GRADUATE OF COLUMBIA COLLEGE WITH A BACHELOR OF ARTS DEGREE IN BUSINESS MANAGEMENT.

BEI PUTS NEW BITE IN THE COBRA.

Introducing the XM138. A Rocket Management System (RMS).

- Automatically inventories and displays the quantity and type of rockets. Reduces pilot workload and eliminates visual inventory... a BIG advantage in high-threat environments.
- Allows the pilot to select the quantity and type of rockets, and fire them in singles, pairs and quads at multiple firing rates, automatically maintaining proper weight balance at all times.
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- RMS permits random loading within each zone for faster loading turn-around.
- Incorporates self-test capability to the AVUM level for improved maintainability.
- Provides ground fault monitoring for greater system safety.
- RMS is upward compatible with new warhead designs, insuring future growth potential and cost-effectiveness.
- RMS. A totally new microcomputer approach to the cost-effective 2.75 rocket weapons system.

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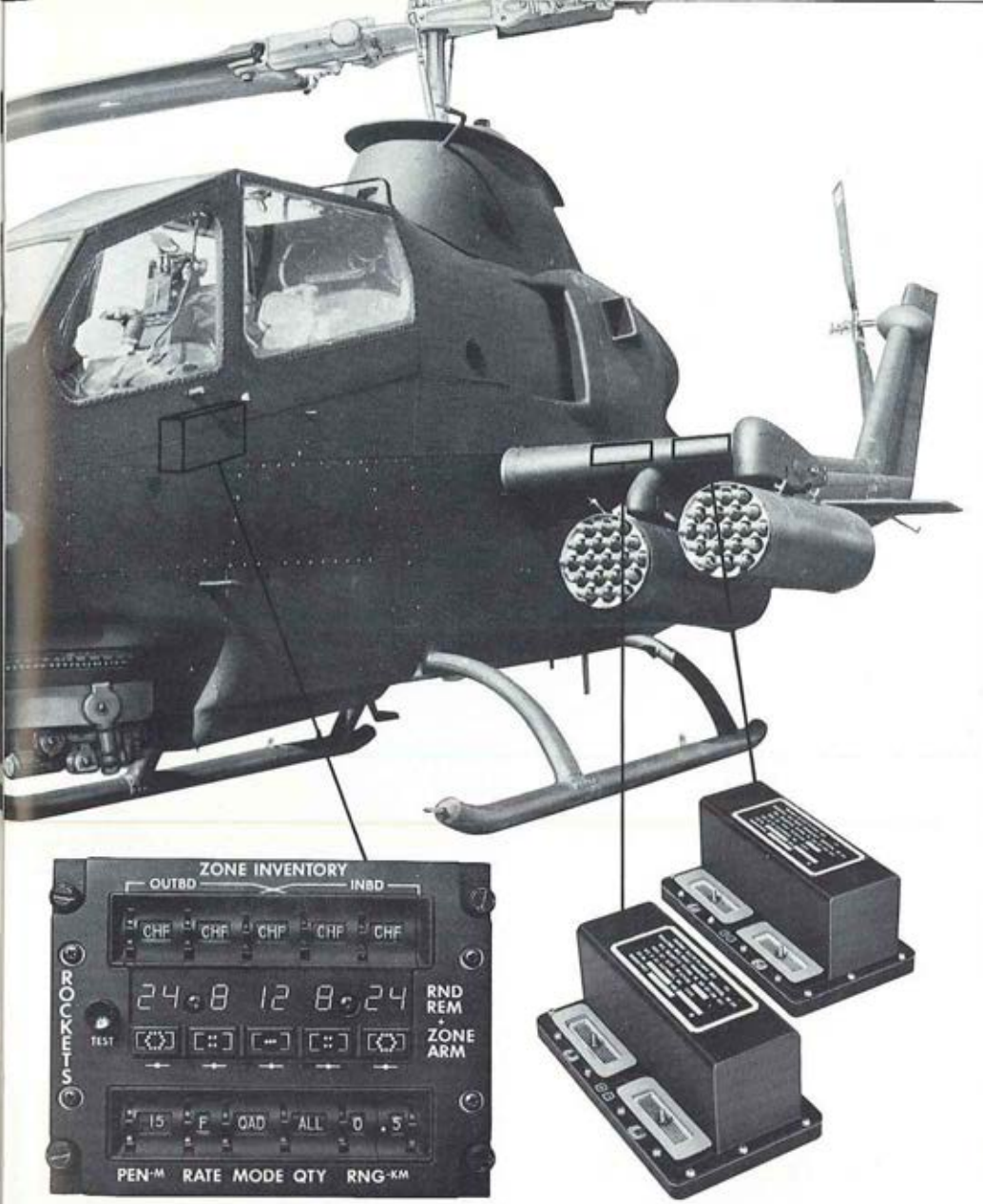

System is comprised of one cockpit Display Unit (DU), 4.5 x 5.75 x 7 inches; and four Operation Units (OU), 3.1 x 4.1 x 7.5 inches each unit. The entire Rocket Management System weighs less than 18 lbs. (8.2 kg.)

COBRA: THE SNAKE'S BITE BECOMES MORE LETHAL

Colonel Donald R. Williamson, the Cobra Project Manager, calls the AH-1S (MC) the most potent "Snake" in the Cobra family and a full partner ready to provide the Army with a truly formidable antiarmor capability

FROM a modest and controversial beginning the attack helicopter, with its firepower and mobility, has taken its place as a potent member of the Combined Arms Team.

Recognition of the importance of the attack helicopter concept was inevitable. Realization of the concept, however, was a long developmental process in which the **Cobra** was steadily updated and improved to respond to a more lethal battlefield environment.

A short but proud history

The **AH-1 Cobra** has a relatively short but proud history. Starting with the **HU-1 Warrior** project of 1962, the design has been steadily updated and improved to the point where with the advent of **AH-1S Modernized Cobra (MC)**, it is the most formidable fielded armed helicopter in the free world today.

Not surprisingly, the initial AH-1S developed was not the end-all configuration. In retrospect, it has actually turned into the beginning of a multiphased improvement and modernization program. That program eventually will bring all AH-1S models up to a standard known as the Modernized "S" AH-1S (MC).

The chart (**Figure 1** on the next page) outlines the program in detail, but it can be summarized by saying that all AH-1G and AH-1S, MOD, PROD, and ECAS, will eventually be modified to AH-1S (MC) standards.

At the same time, totally new AH-1S airframes will be in production and old configuration AH-1S's will be updated through Steps 1, 2, and 3. All of the latter, though presently scheduled out through 1985, are dependent upon available funding.

Major Modernized "S", AH-1S's (MC) improvements are outlined in **Figure 2** on page 47. What follows is a detailed account of what are considered to be the more important of these improvements.

Fire Control System

The fire control subsystem is the major effort of the program. Its features include a pilot **Head-Up-Display (HUD)**, fire control computer, air data subsystem, and laser rangefinder.

The HUD provides increased weapon delivery capability for both day and night operation. The primary purpose of the HUD is for aiming the aircraft to fire the TOW missile system and other aircraft weapons. It will aid the pilot in navigation and increase flight safety during **nap-of-the-earth (NOE)** flight.

The HUD consists of two line replaceable units. A pilot's display unit (see **Figure 3**) is mounted on the pilot's instrument panel and presents flight, target acquisition, and weapon delivery information using a **cathode ray tube (CRT)** optical display. All of the HUD symbology appears in the pilot's normal field of view.

The fire control computer provides the gunnery solutions for the turret and rocket weapon systems. It is a general purpose, digital computer which accepts inputs from the universal turret, air data subsystem, laser rangefinder, airborne laser tracker and telescopic sight unit and performs computations that enable the pilot and copilot to deliver ordnance from the turret and

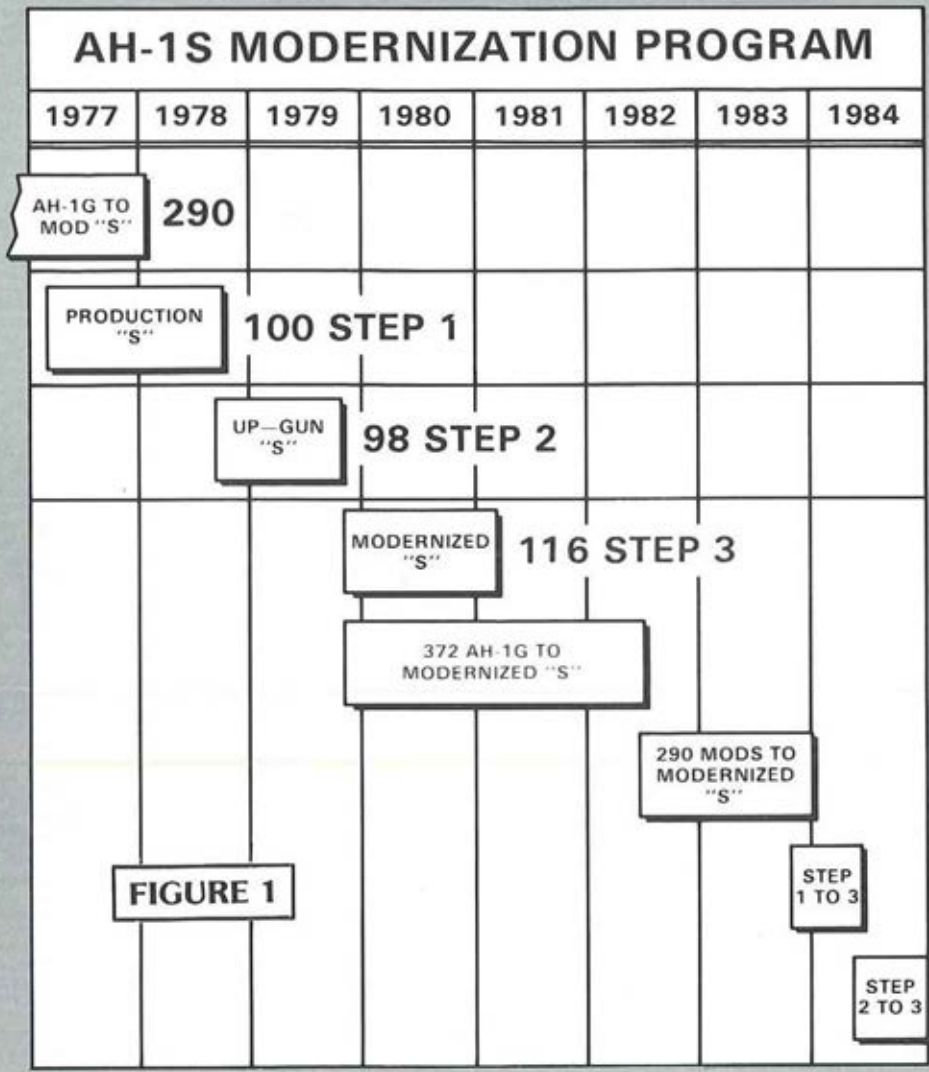

FIGURE 1

FIGURE 2—MODERNIZED "S" IMPROVEMENTS

IMPROVED MAIN ROTOR BLADE	IR JAMMER	CLOSED CIRCUIT REFUELING
AIRBORNE LASER TRACKER	SECURE VOICE	IR SUPPRESSOR
HEADS UP DISPLAY	SCAS COMPENSATION	UNIVERSAL TURRET
LASER RANGEFINDER	IFF	FIRE CONTROL COMPUTER
WING STORES MGT SYSTEM	DOPPLER	OMNIDIR. AIRSPEED SYSTEM

rocket weapon systems accurately.

The **air data subsystem (ADS)** provides three dimension airspeed, downwash, static pressure, and air temperature information to be used by the fire control computer to solve the gunnery problem for increased accuracy of the turret and rocket weapons. The swiveling pitot static probe is mounted on top of the canopy extending out to the right of the aircraft (see **Figure 4** at the right) and is used to gather the data to be sent to the fire control computer.

The primary purpose for the addition of the laser rangefinder into the TOW **telescopic sight unit (TSU)** is to enhance the ballistic weapons accuracy on the **Modernized Cobra** and increase survivability from enemy fire by allowing the AH-1S to stand-off to the maximum range of the TOW missile.

The TSU (**Figure 5** on the next page) provides gunner aiming line of sight angles, rates, and laser range to the fire control computer.

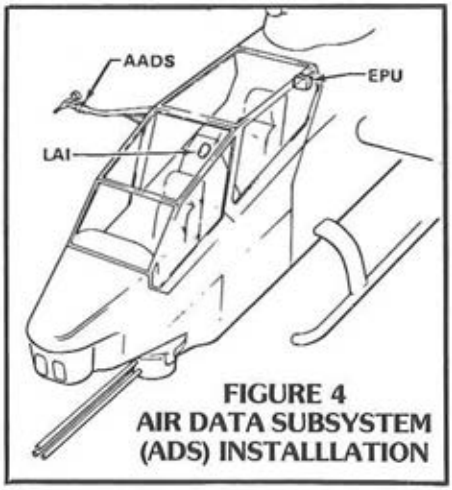

FIGURE 4
AIR DATA SUBSYSTEM (ADS) INSTALLLATION

Universal Turret

This undernose mounted turret is similar in principle and purpose to previous AH-1 **Cobra** turrets, but it differs from all preceding turrets in that it carries a heavier armament system and, additionally, a more advanced control system.

Developed by General Electric's Armament Systems Department near Burlington, VT, the **Universal Turret** offers an improved stand-off capability, improved antipersonnel and antimaterial effectiveness, and the ability to accommodate a 20mm weapon.

The turret replaces that accommodating the 7.62/40mm weapon that has been the standard unit available on all past AH-1 variants.

The **Universal Turret**, as presently available, mounts a 20mm M197 three-barrel gun. It fires through plus or minus 110° forward azimuth and has a variable elevation of 20.5° maximum and a depression of 50° maximum. Position of the **Universal Turret** is controlled by the pilot through helmet sights or by the copilot through use of the TSU of the TOW missile subsystem.

The turret is electrically actuated and is powered by two servo motors; one for azimuth control and the other for elevation. The standard M197 20mm gun fires M50 series 20mm ammunition at a rate of 730 plus or minus 50 rounds-per-minute with an effective range of over 2,000 meters.

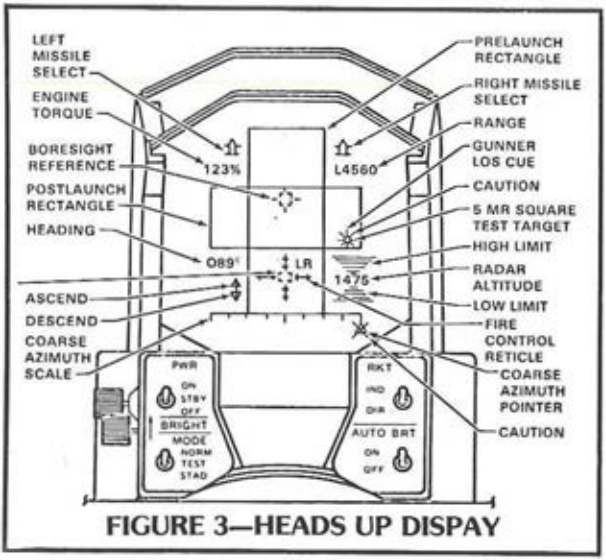

FIGURE 3—HEADS UP DISPAY

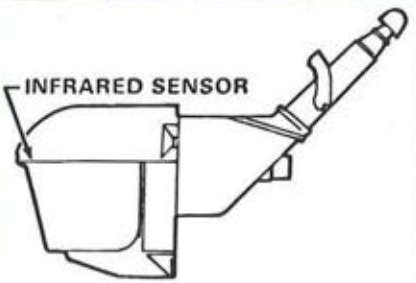

FIGURE 5 — TELESCOPIC SIGHT UNIT (TSU)

Rocket Management System

The 2.75-inch Rocket Subsystem has been one of the primary aerial weapon systems used on the **Cobra.**

There are several development programs that have been initiated by the 2.75-inch Rocket Office, to improve the warheads and launchers to be used on the **Modernized Cobra.** The submunitions, chaff warheads, and lightweight seven-round and 19-round launchers are the newest items in the development program.

The Stores Management/Remote Set Fusing Subsystem developed and manufactured by Baldwin Electronics Incorporated, Little Rock, AR, will use the 2.75-inch warhead and launcher improvements to enable more effective mission accomplishment by **Cobra** crews.

The control panel for the Stores Management/Remote Set Fusing Subsystem **(Figure 6)** will provide the means to select and fire, while in flight, any one of five types of external rocket stores.

It will allow the pilot to set range and select the fuze setting best suited to the type target being engaged to include settings which will permit penetration of three canopies or fortifications protecting selected targets.

TOW

Perhaps the most important weapon carried by the AH-1S is the TOW missile. Designed for antiarmor duties, the TOW is a stand-off weapon that is rocket-propelled and wire-guided. The AH-1S (MC) is capable of carrying eight TOW's on its stub wings. However, when it's armed with fewer missiles, a mix of different armament subsystems can be carried.

The effective range of the TOW is from 500 to 3,750 meters. The time of flight of the TOW is determined by the distance to the target. When firing from the hover, the maximum time of flight is 21.5 seconds. Other times of flight, based on distances, are as follows:

Meters	Seconds
3,750	21.5
3,000	15.0
2,000	8.8
1,000	4.0
500	2.0

Conveniently, the capability of the TOW to accurately destroy targets at its maximum ranges gives the aircrew a stand-off advantage over many air defense systems. The Soviet SA-7 SAM, for instance, has a maximum range on the order of 3,000 meters; the range of the Soviet ZSU 23-4 anti-aircraft gun is 3,000 meters; and the range of the Soviet ZPU 14.5 anti-aifcraft gun is 1,400 meters. The TOW's 3,750 meter range capability is well beyond the threat posed by these weapons.

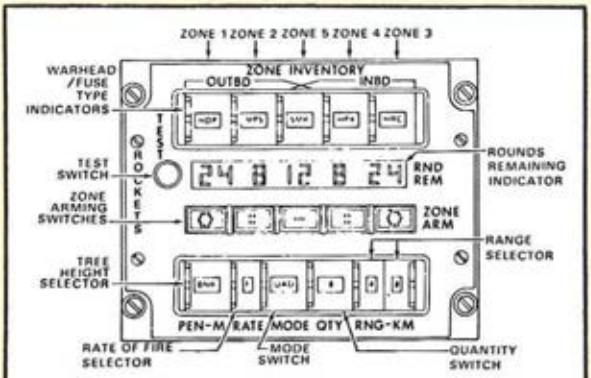

FIGURE 6—STORES MANAGEMENT/REMOTE SET FUSING SUBSYSTEM

The Cobra is Now... *and Tomorrow!*

The AH-1 "Cobra" has been on the job since 1967, and has proven itself a deadly armored vehicle killer plus a highly effective close-support weapon system. HR has been there too...supplying hydraulic flight controls and components on all Cobra models. And, we'll still be on board as the Cobra evolves into an even more efficient weapon—providing controls that feature higher survivability through new design concepts and service-proven actuator reliability that has become well known to the industry.

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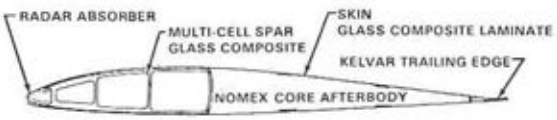

FIGURE 7—IMRB/K-747 BLADE CONFIGURATION

Improved Main Rotor Blade

A new composite main rotor blade has been developed by Kaman Aerospace Corporation for use on the AH-1S (**Figure 7**). It has been designed to be used on an existing AH-1S airframe or its rotor system without modifications.

The blade was first installed in April, 1979, on the 149th new production ECAS helicopter which was fielded at Fort Bliss, TX, in June, 1979. This new blade provides improved flight performance, survivability features, and RAM while reducing the radar cross section and acoustic detectability signatures.

The new blade has been designed for almost total repairability of the skin and core aft structure by personnel in field units. This is accomplished with the aid of a heat-pressure pack tool, which can accomplish the repair of the blade without removing it from the aircraft.

A survivability feature of the new blade permits 30 minutes of flight after being hit with a single 23mm high explosive, incendiary, tracer round and is invulnerable to a single hit from a 12.7mm round. The "through damage", which would result from this type of a ballistic hit involving both skins and the core, can be repaired by personnel in the field in less than three hours. The maximum allowable operating time for the new blade is 10,000 hours, which is an increase of 9,000 hours over the present metal blade.

A major increase

Usually, a major tree strike by a helicopter results in a catastrophic accident, but there is recent evidence obtained through an unplanned demonstration that improved composite rotor blades increase chances for crew survival and reduce aircraft damage.

During the target acquisition phase of a simulated antiarmor mission, while the AH-1S Cobra was performing an **out-of-ground-effect (OGE)** hovering maneuver, the tail rotor struck and cut the top 10 feet out of a 60 foot pine tree. The loss of tail rotor control forced the flight crew of the AH-1S gunship to land the helicopter immediately. An autorotation was then initiated and as the Cobra descended to the ground the main rotor blades came into contact with a 60 foot pine tree. The blades severed four sections of the tree ranging from 7 to 9½ inches in diameter. Despite these repeated tree strikes, the transmission was not displaced and the main rotor blades remained attached to the damaged **Cobra**. The helicopter continued to the ground and remained in an upright position.

A visual examination of the aircraft by qualified maintenance personnel indicated there was no apparent damage to any root hardware of either blade, rotor hub, mast, or rotating flight controls, nor were any of the crew injured. The helicopter involved in this accident was an AH-1S ECAS with the improved main rotor blades which are made of composite materials.

A valid example

This is a valid example of the inherent resilience and energy absorbing characteristics of the composite main rotor blade and its enhancement of the **Cobra's** survivability.

The AH-1S (MC), which is the focus of this article, is the present visible end result of many years of concentrated **Cobra** development and is the most lethal and potent "Snake" in the **Cobra** family.

As a full partner in the hi-low mix with the AH-64, the AH-1S (MC) will help the attack helicopter family provide the Army with a truly formidable antiarmor capability. □

ABOUT THE AUTHOR

COL DONALD R. WILLIAMSON IS THE TSARCOM COBRA PROJECT MANAGER. HIS PREVIOUS ST. LOUIS ASSIGNMENTS INCLUDE A TOUR AS SGS AND EXECUTIVE OFFICER OF USA AVRADCOM. HE HAS ALSO SERVED IN THE ARMY AVIATION LOGISTICS OFFICE IN HQDA.

HOW ARE WE DOING? THE SYSTEM ASSESSMENT PROGRAM

Co-authors Ann M. Kemppinen and Harold P. Hammann, as highly qualified systems analysis personnel, discuss TSARCOM's role in soliciting and measuring user satisfaction with the performance of a given system.

THE U.S. Army **Troop Support and Aviation Materiel Readiness Command (TSARCOM)** is dedicated to providing the best possible support and maintenance management for its worldwide network of systems.

A barometer of TSARCOM's success in this commitment is user satisfaction (or lack of it) with the performance of the system in the field.

System assessments provide a means for TSARCOM to interface with the users for the purpose of defining problems which may be degrading the system in areas of operational readiness, adequacy of training and manuals, safety, and maintenance.

Standardized reporting format

The Headquarters DARCOM-directed **System Assessment Program** extends throughout all of the major subordinate commands. All use the same standardized format for the **System Assessment Final Report** which serves in the assessment spotlight.

Though similar in structure, each TSARCOM **System Assessment** is unique, reflecting the 23 highly varied aviation and troop support commodity groups managed by the Command.

From the technically complex rotary wing and fixed wing aircraft which comprise the major thrust of the program to the assessments of such systems as field kitchens, generators, and clothing repair shops, TSARCOM uses system assessments as vehicles to surface the problems which may reduce the effectiveness of the system.

System assessments delve into every aspect of the operation of a fielded system — technical, operational, environmental, safety, human factors, and support — so the system is not merely a piece of hardware but everything that is required to make that hardware work effectively.

This includes the personnel required to operate the hardware as well as the training received, the manuals which are required for use in both operating and maintaining the piece of equipment, and the supply and maintenance support which TSARCOM provides.

In order to assist the accomplishment of a system assessment, TSARCOM has developed a step-by-step instruction book — the **System Assessment Cookbook** — so that responsible elements and team members can conduct a system assessment.

A special type of system assessment is the **Disciplined Review (DR)** where the system proponent and the users meet for a face-to-face

ABOUT THE AUTHORS

ANN M. KEMPPINEN IS AN OPERATIONS RESEARCH IN THE DIRECTORATE FOR PLANS AND SYSTEMS ANALYSIS. SHE HOLDS A BS AND AN MBA FROM VIRGINIA COMONWEALTH UNIVERSITY, RICHMOND, VA. SHE WAS EMPLOYED IN THE PRIVATE SECTOR BEFORE JOINING CIVIL SERVICE TWO YEARS AGO. HAROLD P. HAMMANN IS THE CHIEF OF THE MATERIEL READINESS ANALYSIS BRANCH OF THE SAME DIRECTORATE. HE HAS A BS AND A BA DEGREE FROM WASHINGTON, UNIVERSITY, ST. LOUIS, MO. DURING HIS MORE THAN 30 YEARS OF CIVIL SERVICE HE'S SERVED IN THE COMPTROLLER AND LOGISTICS FIELDS.

HOW'RE WE DOING?

(Continued from Page 45)

problem solving effort. The Army fixed-wing C-12 aircraft was the subject of a recent DR. Managers and users from all over the world compared notes on initial C-12 operating experience.

The unique mission of this aircraft — the requirement that it be used in less than favorable landing areas — was a major topic of discussion. Corrections for wheel problems encountered while using primitive airstrips were addressed.

A system assessment starts with the development history followed by a description of the system, an explanation of the original design objectives, and a narrative on the developmental and operational test results. A review of corrective actions or waivers which were taken on deficiencies recorded during tests is then made available to the reader.

The initial field performance, changes made to the system since it was fielded, current field performance, and adequacy of logistical support are presented next.

The key element of a system assessment is the information determined by asking the field user just what he thinks of the system. Data are obtained by using questionnaires and conducting personal interviews.

The good news and the bad

Sampling user opinion via questionnaires gives TSARCOM both good news and bad news, and it's the bad news that gets all the attention. A helicopter mechanic operating in a Korean winter has the best fix on the problems degrading the system and his words are heard!

Personal contact with the actual user, i.e., the operator or the person charged with maintenance, is so important to the **System Assessment Program** that when TDY limitations restrict travel, TSARCOM personnel take the Command aircraft to visit the units in the field, preferably out of a garrison environment.

The users are followed in the Louisiana swamps, through flash floods of Texas, and in the California desert of Camp Irwin for candid comments. It is from such places that we get an accurate picture of field performance.

In the analyses of these data, quantitative methods are often applied, including statistics and operations research. It's developments in this area of the **System Assessment Program** from which the recommendations to improve the system come to light.

Huey problem unraveled

The system assessment of the UH-1 **Huey** uncovered many needed improvements. One of the very "popular" ones corrected a long-standing problem of false warnings experienced at low altitudes. A new low **revolution per minute (RPM)** warning system was the improvement action taken to correct the problem. At 3,000 to 4,000 feet the helicopter was fine, but with an upgraded mission profile for **nap-of-the-earth (NOE)** flying, the system was plagued with false warnings.

The installation of the new RPM warning system on all UH-1s began in Dec 1979 and should be completed by summer, 1981.

Needed improvements are identified in the hardware, supply support, maintenance, safety, manuals, training, doctrine, or use of the system; and then a system improvement plan is developed. The formal **System Assessment Final Report** is published and distributed to those involved with that particular system throughout the Army.

All improvements recorded

An on-going "post completion audit" has been implemented for improvement actions which have been identified through TSARCOM System Assessments. Every assessment completed since TSARCOM's inception on 1 July 1977 has its improvement actions tracked by the Command's on-line data system.

A video display or a paper hardcopy is produced which lists, in an easy-to-read matrix grid, the problem identification, action to rectify the problem, start and completion dates, responsible agency, and participating agency.

Keen interest in this tracking system at the Command group level is indicative of the importance placed upon logistics and support management at TSARCOM. The intended end result is improvement of the total system, and these improvements, the crux of the TSARCOM **System Assessment Program**, are the big payoffs for the efforts expended. □

QUALITY MEANS PERFORMANCE

Rotair Industries, with 20 years of experience in Sikorsky parts, is now producing components for the UH-60A Black Hawk.

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QUALITY IS EVERYONE'S JOB

Recognizing that not all problems associated with the quality, reliability, and maintainability of the Army's fielded systems are cited through existing reporting procedures, product assurance expert James R. Carlson says TSARCOM takes to the field

WHY do soldiers submit **Quality Deficiency Reports (QDR)**? How are they used? Where do they go?

An aircraft system can become a millstone around the Army's neck if the system results in excessive cost per flight hour, has an unacceptable operational readiness, and results in a lack of confidence in the system by the user.

The basic root cause of user dissatisfaction is **poor quality.** Good quality is **not** an accident but the result of a well defined quality program starting during development and ending with obsolescence of the system. The quality program must cover not only the design and fabrication of the total system, but must also cover the software, logistic support, and overhaul programs.

A life cycle program

The quality program for an aircraft system is truly a life cycle program requiring dedicated effort from contractors, the development and readiness commands, the Defense Logistics Agency, DOD plant activities, and DOD depots. There is also one other key element in the quality program — the **soldier customer.**

The Army, unlike commercial customers, cannot change producers using customer satisfaction as a driving factor in obtaining the desired quality. The Army must correct quality problems by resolving them with the producer. TSARCOM must support the field soldier, and a critical phase of this support is supplying items of quality — in short, obtaining **soldier satisfaction.**

There are several keys to obtaining a quality item. First is a basic package that describes the item and identifies those characteristics that must be controlled while implementing the required controls. This package is the responsibility of the development command.

Next, the production contractor or depot must have a well defined and controlled quality program to assure compliance with quality provisions in the technical data package.

Third, the government must establish a program to monitor the contractor's performance in the quality area and assure compliance.

Finally, the government must maintain a feedback system that evaluates the quality program by assessing the hardware produced and taking corrective action as required.

The key evaluator: The soldier

The feedback system uses test data and QDR's from contractors and depots as well as various other sources, but the key evaluator of the overall effectiveness of this quality program is the soldier user. **TSARCOM discovers problems via QDR's written by the soldier . . . it's as simple as that.**

These receive priority treatment since the impact can be widespread through the field and depot inventories. If they involve safety, special procedures exist to assure quick response.

The current field reporting system has combined the QDR and **Equipment Improvement Recommendation (EIR)** reporting under TM 38-750, using the existing QDR form SF 368. At TSARCOM, these reports are reviewed upon receipt by Maintenance Engineering and Product Assurance. Then they are assigned to appropriate pro-

duct assurance elements to assure they are answered quickly.

This system is automated and gives TSARCOM a method of evaluating a contractor's performmance over extended periods of time. TSARCOM makes every effort to involve the contractor, and when he is determined to be responsible for failure, TSARCOM seeks financial restitution.

Corrective actions

Essentially, TSARCOM evaluates the type of problem and the quantity of items that are affected. Then, TSARCOM takes actions to purify the stock in depots and the field. The contractor or depot resources are used to perform a detailed evaluation of the problem which is then submitted to TSARCOM for final evaluation and acceptance.

Corrective action is then taken to prevent a reoccurrence, and the originator of the complaint is informed of actions taken. This process has a 60-day suspense and if it's not resolved within this time, the soldier submitting the QDR is notified what TSARCOM is doing.

The QDR system is essential and TSARCOM needs the field's support and active participation. You may not always like our answers. However, several factors must be considered. Random quality defects can occur even under the best quality system. Flight safety and mission performance are most important in our quality control.

Random sampling pursued

The second consideration is cost for noncritical items. The Army cannot bear the expense of a 100% inspection of all characteristics of every item procured; thus, sampling procedures with acceptable quality levels are used to assure that items are free of quality defects. This concept, by the way, is used commercially for nearly every item you buy in a store.

Just like the producer of the PX radio, TSARCOM needs feedback to evaluate the quality system. Before a response is sent concerning a random quality defect, TSARCOM makes a complete evaluation to assure it is not a widespread problem. QDR's on critical items are always pursued by TSARCOM to assure prevention of similar problems in the future,

ABOUT THE AUTHOR

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cleansing of depot stocks, and, if needed, safety of flight or maintenance advisory messages are sent.

The QDR's from the field are a critical element of the Army's quality program, and TSARCOM acts on every complaint received. However, we know from other data indicators and field visits that not all problems with the quality, reliability, and maintainability of our products are reported through the existing reporting procedures.

Getting the complete story

Like a puzzle with missing pieces, TSARCOM attempts to get the complete story. One approach is to pursue a semi-controlled sample data collection program. This involves sending dedicated data collectors to selected using units. Field personnel record unscheduled maintenance actions. These are picked up by the data collector who validates the informaton on-site.

This information is sent to TSARCOM for editing, processing, and analysis, using an automated system to do this. The data collected includes operating time, failure maintenance time, and repair parts usage.

Key: Aggressive data collection

TSARCOM then has a current record of the item's overall performance and problems are readily identifiable. This program was proven on a trial basis during calendar year 1978 on the AH-1S **Cobra** at Fort Campbell, KY. In January, 1979, it was expanded to sample units for Army aircraft in CONUS and a contract for CONUS is in the initial stages of implementation. The key to this program is a good aggressive on-site data collector.

Remember, the process of obtaining the quality required in the Army's aircraft systems is truly everyone's job — contractor, Department of the Army civilians and, especially, the soldier using the system. □

SERVING OTHERS WHILE SERVING OURSELVES

Serving as a technical advisor in TSARCOM's Directorate for International Logistics, CW3 Robert B. Watkins says the Quality Assurance Team's role is vital whenever the US furnishes materiel or technical support to other nations.

THE **Directorate for International Logistics (DIL)** at TSARCOM is responsible for the administration of security assistance for troop support and aviation materiel and, as such, is an important arm of the logistics aspects of U.S. foreign policy.

The Directorate functions much like a project manager and is expected to orchestrate the total effort on the principle that quality products and service insure successful Security Assistance Programs while assuring that all costs incurred are recouped.

Over 40 countries use the Huey

Today, the TSARCOM Directorate for International Logistics provides materiel or technical support to over 80 countries concerning over 30 different types and series of helicopters and fixed wing aircraft. The UH-1 series alone has been delivered to over 40 countries and further deliveries are pending. The **Huey** has been furnished as Grant Aid equipment, FMS, lease, and through co-production to the sum of over 1,500 aircraft.

Formal agreements between TSARCOM and approximately 50 foreign customers are currently active and involve materiel and services valued at over $300 million.

In the last three years, the DIL at TSARCOM has had some unique and interesting assignments. One of the most unique programs concerns the Hughes **500MD Helicopter Program** for Kenya. The delivery of the first Hughes **500MD** to Kenya in December, 1979, represents the birth of Ken yan Army Aviation. The program is especially unique in that the **500MD** is a non-standard aircraft system to U.S. Forces and the first program of this kind in Black Africa.

Another project which exemplifies a short notice type requirement within the security assistance community was a delivery of UH-1's to Honduras. The request for the aircraft occurred in mid-February, 1980, and delivery and acceptance by the country's President took just three months. This was TSARCOM's first experience in the delivery of loaned aircraft to a foreign government and the use of an Assembly Team from Corpus Christi Army Depot as part of the **Quality Assurance Team** (QAT).

Welcomed by many

When the first C-141 landed at San Pedro Sula, Honduras, it was greeted by a large contingent of U.S. Embassy, USMILGP, and foreign country dignitaries. Along with one UH-1H, the C-141 carried maintenance tool sets, spare parts, and a spare engine as well as a nine-person QAT and equipment. Within one day, the first UH-1H was assembled and test flown on its ferry flight to Tegucigalpa, the capital city. Nine more UH-1H's followed and were delivered to the capital within 10 days.

In addition to the programs previously mentioned, aircraft deliveries have been made over the last three years to Greece, Korea, the Philippines, Spain, Thailand, Turkey, Austria, Tunisia, Argentina, Israel, and Canada.

Generators, bridges, life support equipment, and other troop support items also make up a significant part of the total FMS cases managed by TSARCOM.

The quality assurance/site

SERVING OTHERS

(Continued from Page 56)

survey function, in association with the "total package" concept is considered to be one of the key elements for the success of any particular Security Assistance Program.

The manner in which the equipment is delivered and presented can determine the success or failure of a program. It is for this reason that individuals who comprise the Quality Assurance Team are handpicked not only for their technical expertise and personal attributes, but also for their knowledge of the host country in which they will be working.

People pose problems

Typically, the greatest problems are caused by people and their personalities, habits, and attitudes, and not by the equipment being delivered. AR 310-25 defines quality assurance as "that function of management through which conformance of materiel to contract and specification requirements is assured"; but the quality assurance function doesn't end there.

When dealing within the foreign environment this definition has the added requirement that neither the equipment nor the attitudes displayed by the people making delivery reflect adversely upon the U.S. Government.

U.S. credibility on the line

To the host government, a UH-1H helicopter after it arrives in a foreign country no longer represents the U.S. Army; the UH-1H and the Quality Assurance Team now represent the U.S. Government and a product produced by Bell Helicopter Textron, a U.S. company. If the product is faulty or if any fault can be found in the manner in which it is presented, this may adversely affect the credibility of the U.S. Government and the future marketing by the U.S. company.

The Quality Assurance Team, by the way, played a major part in each of the programs and aircraft deliveries previously mentioned.

The security assistance effort at TSARCOM is based on the foreign policy of the U.S. Government. Actions taken at TSARCOM are at the leading edge of this foreign policy because TSARCOM makes materiel deliveries that are highly visible to recipient countries.

Every effort must be taken to provide the highest quality materiel and services in a timely manner. □

ABOUT THE AUTHOR

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NEW EQUIPMENT TRAINING TODAY, A WORLDWIDE EFFORT

A training manager for newly-fielded or modified materiel, TSARCOM's Rick J. Brown indicates that the role of NET is to provide the initial transfer of knowledge from the materiel developer.

WHAT is **New Equipment Training (NET)**? Webster's Dictionary defines training as "to teach so as to be fitted, qualified, or proficient."

However, you can find as many definitions of NET as there are people, yet most of us in this business refer to NET as the "initial transfer of knowledge."

Not an MOS-producing program

There are two aspects of this definition that bear illumination; first, we train personnel who are already qualified in their basic specialty, and second, we provide only that information necessary to increase their skills and knowledge. This is not, therefore, a **military occupational specialty (MOS)** producing program.

Our responsbility as a DARCOM representative activity is to integrate NET functions into the **Integrated Logistic Support (ILS)** process early in the material development life cycle. This is done to insure that NET and other ILS and related materiel system milestones are adequately identified and programmed for timely realization.

There are four distinct phases of NET. **Phase I** begins the management process, and the Staff Planners course is a product for management functions. In **Phase II**, management efforts are reflected in the quality of training provided. **Phase III** begins the fielding process and **Phase IV** is the final product for all NET managers, providing interim training until the **Training and Doctrine Command (TRADOC)** can produce qualified people through resident training. NET requires a well defined and disciplined management team and system to insure that training is available when new or improved equipment is distributed.

In more practical terms the role of NET is to provide the initial transfer of knowledge from either the material developer or material provider on new or modified equipment entering the U.S. Army inventory for the first time.

Due to the complexity and sophistication of many of the new major systems and equipments being fielded, or on the drawing boards, many in the NET business have to resort to private industry for the preparation and conduct of initial technical training courses.

The bulk of these technical training courses are dedicated to hands-on training. Programs of instruction, lesson plans, and training aids that are also in use are made available to unit trainers. This is to assist them in presenting similar courses of instruction to others in their organizations.

Current NET Programs

Here are some of the more significant ongoing **New Equipment Training Programs:**

AH-1S (MC) — The NET Program started during FY 76 with the deployment of the **New Equipment Training Team (NETT)** at Hunter-Stewart AAF and the training of approximately 240 personnel in one or more of the nine courses provided. Target date for completion of the NETT will occur during FY 82.

UH-60A — The NET Program for this system started in FY 67 and presently TRADOC has established resident training courses, however, a NETT will

deploy to four CONUS sites and one OCONUS site to supplement the training effort for TRADOC schools; the NETT effort started in FY 80 with completion scheduled for FY 81.

CH-47D — The modernized CH-47D NET Program started during FY 74. Its target date for a NETT deployment in CONUS is FY 83 and OCONUS FY 84.

Special Electronic Mission Aircraft — The NET Program effort started during FY 75. The Quick Fix 1B, EH-1H helicopter has been undergoing OT III testing with approximately 90 test personnel receiving training provided by a NETT. An estimated deployment date for the NETT (OCONUS) will take place during FY 81.

High Performance Hoist — This is a commercial item presently adopted by the military undergoing OT III testing. The initial program started during FY 76. At this time it is planned for 10 active Army, 11 National Guard, three Reserve, and two OCONUS units to receive training provided by a NETT with a target deployment date during FY 81.

AV/APR-39(V)1 — The NET effort for this program started in June, 1978 and is still ongoing. To date, operator training for pilots by TSARCOM NET personnel has been conducted at 10 OCONUS sites and six CONUS sites with 230 pilots receiving training.

ABOUT THE AUTHOR

RICK BROWN IS ASSIGNED TO THE AVIATION MATERIEL INTRODUCTON BRANCH OF THE TSARCOM FIELD SERVICES ACTIVITY. THE EQUIPMENT SPECIALIST IS A TRAINING MANAGER FOR NEWLY-FIELDED AND MODIFIED MATERIEL.

Future NET Programs

The major systems shown below with their target deployment dates are presently under a development phase of life cycle management:

Advanced Attack Helicopter (AH-64)... FY 84
Remotely Piloted Vehicle..... FY 84
Special Electronic Mission Helicopter (EH-1X)..... FY 82
Special Electronic Mission Helicopter (EH-60A)..... FY 82
Special Electronic Mission Helicopter (EH-60B)..... FY 84
Special Electronic Mission Aircraft (RC-12D)..... FY 83

IT'S FRIDAY SO THERE MUST BE A SAFETY OF FLIGHT MESSAGE

John O. Morris, who works with the AH-1 Cobra Program, indicates that such messages go out to the field throughout the week — even on Sunday — and aid in the solution of aviation safety problems

"IT'S Friday afternoon, and TSARCOM is plotting to spring a Safety of Flight message on us . . .Those guys at TSARCOM wait around all week just to ruin our weekend with a Friday Safety of Flight message."

TSARCOM has heard this often from aviators, crew chiefs, and maintenance personnel in the field. Those messages go out on Saturday and Sunday as well and most, believe it or not, go out on Monday through Thursday. However, Fridays' messages are just the most memorable.

Why do we have them? How does TSARCOM handle this highly visible mission?

TSARCOM is responsible for the logistic management of several thousand Army helicopters and fixed wing aircraft located in all parts of the world, and one of its major responsibilities is to keep a close watch on the flight safety of this equipment.

A variety of reports

In order to keep close tabs on how the aircraft are operating, a variety of reporting procedures are used. Each time the equipment fails to perform as it should, the operator is required to submit a **Quality Deficiency Report (QDR)**. Each of these reports is evaluated for safety implications. Operators are also required to submit a report each time the aircraft has an unscheduled landing. If the unscheduled landing damages the aircraft, it will be determined at that time if the situation warrants a detailed on-site evaluation by technical people.

The Aviation Safety Center at Ft. Rucker, AL, provides the major support for the initial evaluation of an aircraft accident. TSARCOM provides back-up engineering support if the Safety Center considers it necessary, and also provides on-site Field Maintenance Technicians to assist aircraft operators on a day-to-day basis with maintenance problems and to advise them on safety matters.

At TSARCOM a Maintenance Engineer is assigned to each aircraft system, his job being to maintain direct contact with the field and to receive submitted field reports for evaluation.

Additional back-up support

After assessing them for safety areas, he may turn to the Army **Aviation Research and Development Command (AVRADCOM)** for additional technical advice from that Command's systems engineers who are assigned to each aircraft type. They provide back-up to the Maintenance Engineer in evaluating safety related problems.

When the Maintenance Engineer assigned to an aircraft system determines that a safety problem requiring grounding of the aircraft may exist, he presents his findings to the TSARCOM Commander through his Division Chief and Directorate. If it is probable that a safety condition exists, the Maintenance Engineer drafts a message to all operators of the series of aircraft affected worldwide recommending the corrective actions to be taken.

After the draft is prepared, it is reviewed by a working level group whose personnel are assigned to the particular aircraft as his/her full-time job. The safety messages are then review-

IT'S FRIDAY!

(Continued from Page 61)

ed by all areas of the Command, including the Safety Office, the **Readiness Project Officer (RPO)**, and the Maintenance, Product Assurance, Procurement, and other Directorates in TSARCOM that may be affected or have an interest.

Review and approval

After the working level group has approved the Safety-of-Flight message, it is then finalized for review at a director level meeting that is attended by all TSARCOM Directors who are affected. Following the Directors' review and their approval of a Safety-of-Flight message, the message is presented to the TSARCOM Commander for his approval. On his approval, it's then dispatched electronically worldwide to all operators of the affected aircraft series.

Each operator of an aircraft who receives the message must comply with the requirement of the message within a prescribed time frame. Operators are required to report to TSARCOM Headquarters that they have received the safety message and will comply.

A tracking system utilizing aircraft serial numbers is maintained by the Maintenance Directorate to account for each aircraft affected by the safety message. If TSARCOM records indicate that an aircraft has not been inspected, the operator is notified that the safety inspection must be accomplished.

Rapid response is important

Through our reporting and monitoring systems we're able to maintain a close surveillance on Army aircraft safety and act promptly. When a safety problem is discovered, response time is a key factor.

If grounding of aircraft becomes necessary, the message requiring the grounding will be issued within 24 hours. This means that the message will be issued on a Friday afternoon or a Sunday morning, if necessary.

Nothing is more important at TSARCOM than to insure responsive reactions to aviation safety problems and their prompt solution. □

Class of 1981—USA War College Aviators—Row 1, l-r, LTC(P) Larry Osborne; COL John Miller (Faculty); LTCs Bill Reilly & Bill Goulding; LTC(P) Bob Pratt; COL Bill Callender. Row 2, LTCs Curt Herrick, Ray Boland, Larry Karjala, & Terry Henry; LTC(P) Dick Noack; COL Lee Massey; LTCs Don Fritsche & Ron Coleman. Row 3, LTCs Dick Troy & Bill McCoy (USAF); LTC Terry Rosser; LTC Ron Adams; LTCs Lynn Hopper & Jack Turacek. Row 4, LTC Dave Benton (USAF); CMDR(P) Bob Dykes (USN); LTC(P) Pat Brown; LTC Tom Jackson; LTC Tad Oelstrom (USAF); LTC Freeman Howard.

ACIP

(Continued from Page 12)

The foregoing table on page 12, which tells by years of service the losses of Aviation Warrant Officers to the Army, shows that total losses were exactly the same in FY 79 and FY 80 although the earlier table shows an improved third year retention rate for AWOs trained in FY 77.

Additional Army statistics depict that in any "continuation analysis" of commissioned and WO aviators by years of service, the percentages at the critical measurement point (at the end of 3rd year of obligation) show that the continuation rate for commissioned aviators is 79% while the AWO retains at only 57%.

Survey after survey

Beginning in January 1978 and continuing through the present, the Army has undertaken many inquiries and surveys. All of these have indicated that the **number one irritant** or reason why AWOs leave the service at a higher rate than their commissioned counterparts has been the issue of the inequity in incentive pay, as illustrated below:

★

Survey: January-August 1978. WO aviators leaving the service (59 respondents).

Finding: 95% dissatisfied with pay.

★

Survey: MG Elton's query to 10 MACOM Commanders (estimated 3,000 AWOs contacted).

Finding: "Pay, especially the inequity in flight pay" the number one factor—cited by all 10 MACOMs.

★

Survey: AWOs leaving the service during the summer of 1980 (27 respondents).

Finding: 74.7% cited flight pay—number one dissatisfaction.

★

Survey: Army Research Institute (1980). AWOs leaving the service from Europe and Forts Bragg, Campbell, and Rucker (1,006 respondents).

Finding: Flight pay inequity the number one cause—cited by over 70%.

★

AAAA's Checkpoint Charlie Chapter in West Berlin has undergone substantial growth in 1980 after an extended period of deactivation during which its membership dwindled to eight. In the interim it has grown over 500% in membership under **COL C.G. Marsh**, its President. In his words, "We in West Berlin have one of the most unique Army Aviation operations in the Army, and are very proud of our AAAA membership activities. Our future appears bright."

The **1980 ARI Survey** had the following as respondents.

. . AWOs with SSN ending in 3, 6, and 8.

. . AWOs who indicated an intention to separate prior to retirement eligibility.

. . AWOs within the company level chain of command.

The **ARI Survey** also determined that the **Top Ten Factors** affecting AWO retention were:

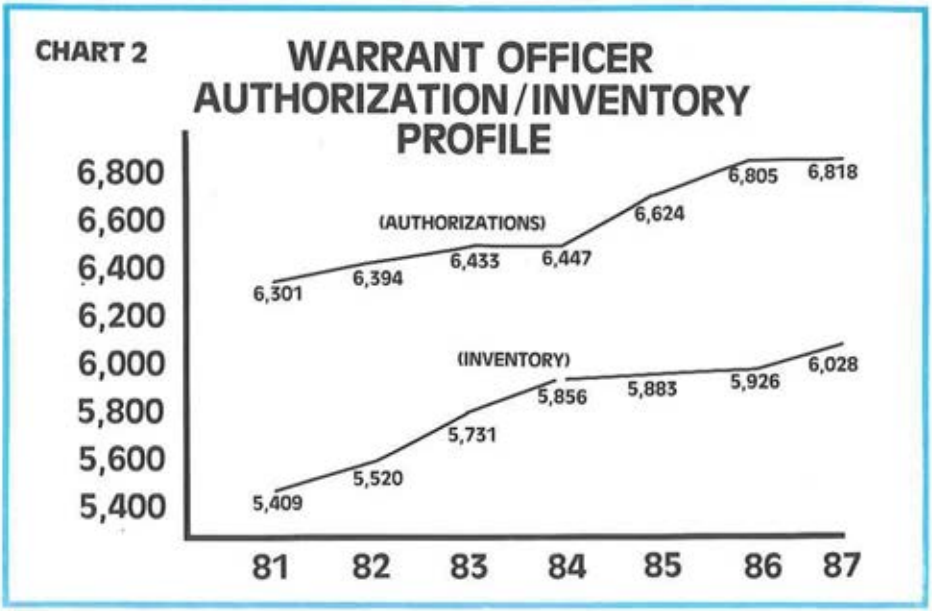
- Equalization of incentive pay
- Low pay
- Erosion of benefits
- Lack of concern for individual
- Lack of professional respect or recognition from chain of command
- Lack of opportunity for desirable assignments
- Lack of competence in aviation matters within chain of command,
- Potential for high pay in civilian sector,
- Lack of leadership,
- Lack of a predictable future in the Army.

In the **ARI Survey** the preliminary results from respondents at the CONUS posts (Forts Bragg, Campbell, and Rucker) and Europe reemphasize that Aviation Career Incentive Pay is the **number one cause** of AWO dissatisfaction and low retention rates.

Aviator Investment

What is the **WORTH** of a UH-1 aviator? What is the cost of replacing such person after he has one year of service within Army Aviation? What's his replacement cost after three years of service, or five years?

The minimum cost of a UH-1 aviator is derived from the basic **IERW (Initial Entry**



Rotary Wing) training cost of $121,431, and projecting the cost of continuing the aviator on flight status (FS) in subsequent years. The table looks like this:

Year	IERW Cost	Add'l FS	Worth
1.	$121,431	$19,740	$141,171
2.	$121,431	$39,480	$160,911
3.	$121,431	$59,220	$180,651
4.	$121,431	$78,960	$200,391
5.	$121,431	$98,700	$220,131

(NOTE: The **minimum** flight hours for a FAC 1 aviator are 84 per year and the estimated total flight cost is $235 per hour. The above figures do NOT include $21,065 for the UH-1 IP Course.)

Cost of a Cobra pilot

If we look at the minimum cost for an AH-1 Cobra aviator, we note that in addition to the IERW basic cost of $121,431, the Cobra pilot undertakes the AH-1G AQC at $42,646, and goes out to the field at an initial cost of $164,077.

His worth, by year, would then be calculated as:

Year	IERW Cost	Add'l FS	Worth
1.	$164,077	$53,328	$217,405
2.	$164,077	$106,656	$270,733
3.	$164,077	$159,984	$324,061
4.	$164,077	$213,312	$377,389
5.	$164,077	$266,640	$430,717

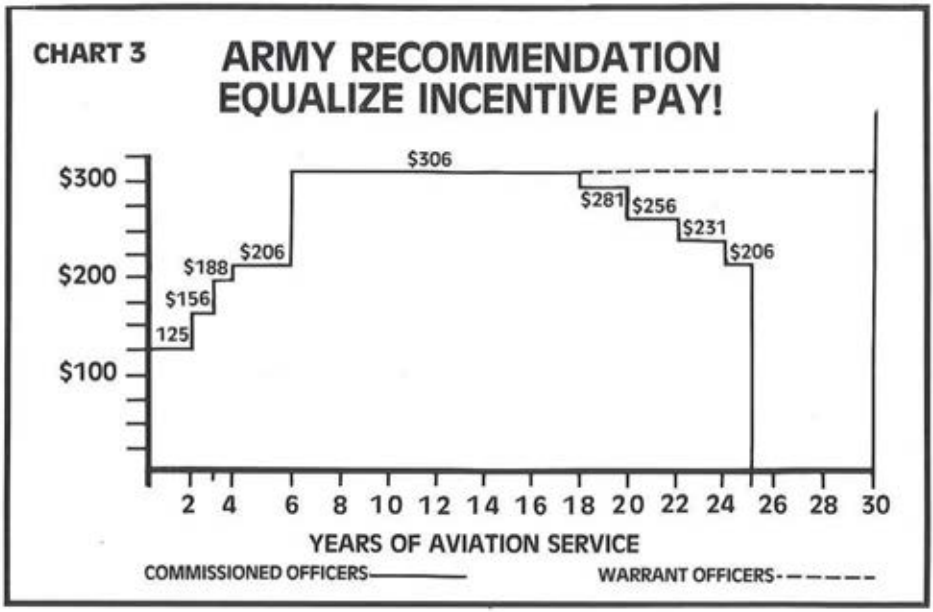
(NOTE: The **minimum** flight hours required for a FAC 1 aviator are 132 per year, and the estimated total flight cost is $404 per hour. These figures do NOT include the additional $44,088 for the AH-1 IP Course.)

The cost of equalization

The Army estimates that the total cost of equalizing the flight pay of Aviation Warrant Officers with that of commissioned officer aviators, based on the amount of rated service, would be $3.2 million per year (as shown in **Chart 2**).

There are several ways in which this extra cost would be returnable to the Army in aviator retention:

. . If the Army were to retain only 26-27 more AWOs on an annual basis than they did in FY 80, this would pay for the $3.2 million cost of equalization.



ACIP

(Continued from Page 65)

. . If the Army were to retain only 8-9 more AH-1 qualified AWOs at the end of four years, this would also justify the equalization cost of $3.2 million.

. . If the Army were to retain only 15-16 more UH-1 qualified AWOs at the end of four years, this too would cover the added cost of flight pay equalization.

Review once again the authorizations and the projected inventory profile of Aviation Warrant Officers between now and fiscal year 87 by looking at **Chart 3.**

The projection is quite clear . . . the Army will be short 790 Aviation Warrant Officers by FY 87. This is based on a requirement to fill authorizations for 6,818 AWOs and a projected FY 87 inventory of 6,028 AWOs.

To make up the shortage of 790 AWOs, the Army must retain 158 more AWOs every year than the Army currently projects, or it would have to pursue other courses.

These other options are to increase annual initial entry training (192 new students per year at a cost of $23 million), or to increase the **Voluntary Recall Program.**

General findings

The Army's general findings are these:

. . Aviation Career Incentive Pay equalization is the major cause of Aviation Warrant Officer attrition.

. . Commissioned Officer aviator retention is more than 20% higher than Aviation Warrant Officer retention.

. . AWO retention must be improved or training input must be increased.

Over the years this magazine and the Army Aviation Association in their editorials, articles, and policies have urged that Aviation Career Incentive Pay be equalized and we support the Army's position in calling for flight pay equalization.

The evidence clearly indicates that the annual loss of experienced Aviation Warrant Officers could be alleviated if ACIP equalization were approved by OSD and pursued. □

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CPT Dennis Crain, APO NY 09031
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CW3 Paul M. Gritz, Woodbridge, VA
SP5 N. Gronsgaes, APO NY 09025
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SP4 R. D. Heitman, APO NY 0902
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LTC James R. Hodge, Ret., Monument, CO
SP4 R. W. Hodges, APO NY 09025
CW3 James E. Holt, Killeen, TX
SP4 Peter M. Hunnen, APO NY 09031
WO1 Vincent Jackovich, Bettendorf, IA
CW3 Thomas Janis, Mableton, GA
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"TAC-X" at Ft. Rucker to be Army WHC flyoff site

PLANNING continued at Fort Rucker for TRADOC and the U.S. Army Aviation Center to host the Army-wide flyoffs of the World Helicopter Championships during the period 9 through 13 March 1981.

"TAC-X", one of the Aviation Center's major tactical training sites, will serve as the staging area for the Army level competitions.

Many Army Aviators will remember TAC-X as the site of their field training exercises at the end of initial entry rotary wing training.

TAC-X is located approximately 30 kilometers southwest of Fort Rucker. This location was selected because it provided two distinct advantages.

(1) It allows the two cross-country events to be flown over the sparsely populated terrain of the southeastern Alabama countryside which will readily challenge the participating crews' navigational skills.

(2) It results in minimum impact on routine student aviator training ongoing at Ft. Rucker which is currently operating at near capacity.

Milestones for all flyoffs are now as follows:

9-13 February — FORSCOM flyoffs at Fort Hood.

9-13 March — Army flyoffs at Ft. Rucker.

April 1981 — Civilian/military competition to select the best team to represent the United States.

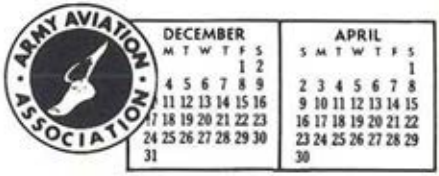
14-23 August — Fourth International World Helicopter Championships in Poland.

Point of contact for coordination of Army flyoffs at Fort Rucker is **Captain Lawrence J. Buehler**, Plans Office, Directorate of Training. Phone: (205) 255-4281.

Questions concerning the Army flyoffs at Ft. Rucker may be directed to **Captain Buehler.**

Good luck to Army competitors!

—MG Carl H. McNair, Jr.



AAAA REGIONAL-CHAPTER MEETINGS

■■ ■■ FEB. 5. Connecticut Chapter. Professional dinner meeting. BG Carl H. McNair, Jr., Cdr, USAAVNC & Ft. Rucker, guest speaker. Site to be announced.

■■ FEB. 6. Washington, DC Chapter. Professional dinner meeting. BG Carl H. McNair, Jr., Cdr, USAAVNC & Ft. Rucker, guest speaker. Ft. Myer Officers' Club.

■■ FEB. 7. AAAA National Executive Board. Quarterly business meeting. Shoreham Hotel.

■■ FEB. 13-14. AAAA National Awards Committee. Selection of 1981 AAAA National Scholarship Winners; selection of AAAA National Award Winners. Ft. Myer, Feb. 13; Stouffer's Hotel, Feb. 14.

■■ MAR. 25-28. 1981 USAREUR Region—AAAA Convention. AFRC, Garmisch-Partenkirchen, Germany.

■■ APR. 23-26. Twenty-Third AAAA National Convention. The Shoreham Hotel, Washington, D.C.

Event #5—Non-Obligatory Free Style Event Fourth Helicopter World Championship

PART 5 OF AN 8-PART MAGAZINE SERIES

AEROKLUB PRL INSTRUCTIONS

"The aim of the non-obligatory free style event will be to demonstrate the top level of the helicopter maneuverability and to display the highest level of pilots' skill.

"The winner of the event will receive the 'Rosemary Rose Memory Cup'.

"The event, for which each participant will have four minutes, will consist of the set of maneuvers compiled and proposed by the pilot.

"The proposals must be submitted to the Judging Panel at least 48 hours before the event.

"All proposed maneuvers should not exceed the helicopter limitations contained in its Flight Manual and in the C. of A. and in no way decrease the level of flight safety.

"The assessment of proposed maneuvers will be made by the Judging Panel and the competitor will be informed on possible objections not later than 24 hours before the event starts.

"Competitors may be required to eliminate or alter any maneuver considered as unsafe by the Judges.

"The free style event will be flown within the defined area of 500 x 500 meters and below a height of 150 meters (500 feet) above ground level."

SCORING

"Points will be scored for:

"Degree of program difficulty . . . up to seventy (70) points.

"Flying technique/skill . . . up to seventy (70) points.

"General impressions . . . up to sixty (60) points.

"The highest and lowest scores will be eliminated. Of the remaining scores the arithmetic mean will be calculated, from which the penalty points will be subtracted."

PENALTY POINTS

"Twenty (20) penalty points will be incurred for each violation of the exercise area limits.

"For the duration of performance longer than four minutes (240 seconds) or shorter than three minutes and 45 seconds (225 seconds) . . . one penalty point per second.

"Flight above the audience or Judges will be considered as dangerous and penalized with the score of zero (0) points."

EXAMPLE

"The competitor performed the program assessed by Judges:

"For the difficulty . . . 65 points,

"For the skill . . . 70 points,

"For the impression . . . 60 points,

"And flew the program during four minutes and four seconds."

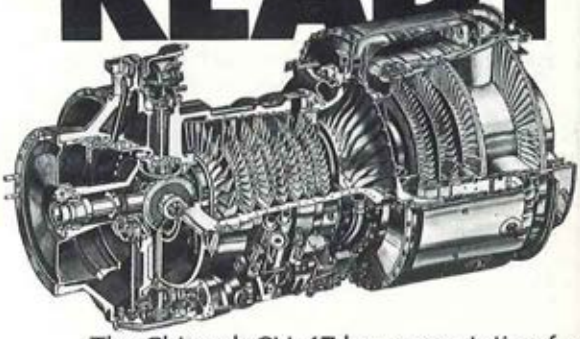
SCORING

"65 + 70 + 60 —4 x 1 = 191 points."

JOHN OSWALT NAMED U.S. TEAM MANAGER

Colonel John W. Oswalt, Ret., Bell Helicopter's Chief of Military Requirements Planning, has been selected by the **Helicopter Club of America (HCA)** as the manager of the U.S. Helicopter Team to compete at the August 14-23, 1981 Helicopter World Championships at Piotrkow Trybunalski, Poland. A veteran Army Aviator with WWII and Korean War service, **Oswalt is a member of the Army Aviation Hall of Fame and a former Vice President on AAAA's National Executive Board.** □

TOUGH AND READY



The Chinook CH-47 has a reputation for being one tough helicopter. And the U.S. Army is one tough customer. That's why Avco Lycoming upped the tough in its new T55-L-712 Turboshaft engine.

Under the RAM-D program, the T55 increases Reliability, Availability, Maintainability, and Durability. Designed to log up to 2400 hours between overhauls (while delivering up to 3750 shp, with an emergency rating of up to 4500 shp), the T55 makes the mighty Chinook easier to maintain. With less time on the ground. And more time in the air.

The latest in a long line of history-making engines, the T55-L-712 Turboshaft keeps getting tougher and tougher. Because at Avco Lycoming, we work harder and harder to make a good engine even better. Avco Lycoming, 550 South Main Street, Stratford, CT 06497.

AVCO LYCOMING DIVISION