

Army Aviation

JANUARY, 1968

Meet the most powerful CH-47 yet: The "C".
(32% more get-up-and-go with the same size power pack.)

(See back cover)



LYCOMING DIVISION
STRATFORD, CONN.



New Chinook lifts 12 tons.

**Boeing's latest helicopter—
the new CH-47C—
carries two tons more than
the "B" model Chinook.**

**Payloads can be carried
internally, externally or both.**

**Size, power, maneuverability
and reliability make the new
Chinook the most versatile
helicopter available for
heavy-lift missions.**

**Boeing's Vertol Division
backs its products with the
V/STOL industry's largest and
most advanced R&D facilities.**

At Boeing, something new is always up.

BOEING HELICOPTERS



Lt. Col.
James R. Barkley



Major
Charles E. Teeter



This plaque goes to each Army pilot who logs a thousand flying hours in the Army Mohawk surveillance system. This month Grumman salutes Lt. Col. James R. Barkley and Major Charles E. Teeter, both of whom have earned the plaque.



Man is the heart of the system. Grumman never forgets it.

Lt. Col. James R. Barkley is a master Army aviator with 24 years' service. Col. Barkley has had a long association with the Mohawk, starting with a two-year tour of duty in Washington, D.C., with the Navy Bureau of Aeronautics and OV-1 Mohawk Development Project Officer. In 1961-62, he was assigned to the Army Aviation Test Board as Mohawk Logistical Evaluation Project Officer. In 1963-64, Col. Barkley was Mohawk Project Officer, Headquarters AMC, Washington, D.C., where he assisted in the evaluation of the Mohawk by the German, French, and Japanese Governments. In April 1964, Col. Barkley was flight leader of the first aerial delivery of Mohawk aircraft from Grumman, Bethpage, N.Y., to Sandhofen, Germany. In July 1964, Col. Barkley began a three-year tour as Director of Maintenance at Sandhofen. He is presently assigned as Chief of Maintenance Army Aviation School, Hunter Army Airfield, Savannah, Georgia. Col. Barkley has a total of over 5350 flying hours, including over 1400 OV-1 hours.

Major Charles E. Teeter is presently attending Command and General Staff College, Ft. Leavenworth, Kansas. His previous Mohawk assignments include a tour at Ft. Huachuca, Arizona, as Chief, Flight Support Branch, U.S. Army Electronic Proving Ground, Operations Officer and Platoon Commander, 73rd Aviation Company, Vietnam; and Platoon Commander, 501st Aviation Battalion, Ft. Hood, Texas. With the 73rd AVN Co. from November '65 to October '66, Maj. Teeter flew over 560 combat hours and received the Air Medal with "V" and 16 oak leaf clusters, Bronze Star, and the Distinguished Flying Cross with oak leaf cluster.



GRUMMAN
Aircraft Engineering Corporation
Bethpage, L.I., New York

ARMY AVIATION

JANUARY 27, 1968

Endorsed by the Army Aviation Ass'n of America

CONTENTS

General Remarks to Reflect a Quarter of a Century of Progress by Colonel Edwin L. Powell, Jr., Director of Army Aviation, OACSFOR, DA, Washington, D.C.	8
Army Aviation Training by Major General Delk M. Oden, CG, U.S. Army Aviation Center, and Commandant, U.S. Army Aviation School, Fort Rucker, Alabama	13
The Infantry-Aviation Team by Major General John M. Wright, CG, U.S. Army Infantry Center, Fort Benning, Georgia	17
Trends in Army Aviation Combat Operations by Major General G. P. Seneff, Jr., Former CG, 1st Aviation Brigade, and Present CG, 3rd Infantry Division, U.S. Army, Europe	20
Logistic Support of Army Aviation by Colonel Delbert L. Bristol, Deputy Commander, U.S. Army Aviation Materiel Command, St. Louis, Missouri	32
Aviation as a System by Lieutenant General Harry W. O. Kinnard, CG, U.S. Army Combat Developments Center, Fort Belvoir, Virginia	35

Questions and Answers

Participants on the "U.S." Army Aviation"
Panel at the 1967 AAAA Annual Meeting
Provide Direct Answers to Floor Questions ..37

ADVERTISERS

Applied Technology Division	23
Avco Lycoming Division	1
Beech Aircraft Corporation	6-7
Bell Helicopter Company	Centerfold
Bendix Avionics Division	27
Boeing Vertol Division	2
Collins Radio Company	5
Grumman Aircraft Engineering Corp.	3, 55
Hughes Tool Company — Aircraft Division	15
Lockheed Aircraft Corporation	10-11
Solar Division	24

ARMY AVIATION is published monthly by Army Aviation Publications, Inc., with Editorial and Business Offices at 1 Crestwood Road, Westport, Conn. 06880. Phone (203) 227-8266. Subscription rates for non-AAAA members: 1 year \$4.50, 2 years \$8.00 to CONUS and APO addresses only; add \$7.50 per year for all other addresses. The views and opinions expressed in the publication are not necessarily those of the Department of the Army. Publisher, Arthur H. Kesten; Managing Editor, Dorothy Kesten; Associate Editor, Jessie Borck; Subscription Fulfillment: Beryl Beaumont. Exclusive articles pertinent to any Army aviation subject, except industry, AAAA, unit, or major command articles, are reimbursable at the rate of three cents to five cents per word for the first 2,000 words published. Second class postage paid at Westport, Conn.

AAAA PHOTOGRAPHS

All photographs taken during the 1967 AAAA Annual Meeting in Washington, D.C., to include those appearing in this issue of ARMY AVIATION, were taken by Miss Rosemarie Vernell, 3017 Gates Road, N.W., Washington, D.C. 20008. Phone: Radio page (202) 737-3576.



Brig. D. W. Coyle

Presentations made at the Thursday, October 12, 1967, "Free World Army Aviation" Panel Presentation held at the 1967 AAAA Annual Meeting in Washington, D.C., will be published in the February, 1968 issue of Army Aviation.

The panel was moderated by COL Edwin L. Powell, Jr. (left), Director of Army Aviation, and represented the first open panel discussion on Army aviation ever held with Allied participation.

Panelists included Brig. D. W. Coyle, MBE, DFC, Commandant, Army Aviation, British Army; COL Fabio Moizo, Director of Army Aviation, Italian Army; COL Gerhard Granz, Aviation Advisor to the Chief of Staff, German Army; COL Maxwell B. Simkin, Director of Army Aviation, Australian Army; and Group Captain George B. Murray, Director, Land Forces Operational Requirements, Air, Canadian Forces.



Replace your outmoded FM whip antenna

with this streamlined Collins blade.

Collins' new 437S-1 VHF FM Blade Antenna eliminates problems previously caused by whip antennas on fixed and rotary wing aircraft. Compact size provides installation flexibility for optimum electrical operation.

The new antenna offers significant improvements in:

- Reliability
- Life cycle economy
- Performance
- Maintainability
- Structural integrity

Its aerodynamic qualities result in minimum drag, suiting it for high speed fixed-wing aircraft as well as helicopters. A mechanically simple coupler, employing microcircuits, is built into the antenna itself, eliminating one external unit and all coupler control wire in the aircraft.

The 437S-1 is readily adaptable to all VHF FM transceivers, and it is flying today on AH-1G's, UH-1's, P-2V's, B-57's, AT-28's, C-47's, and C-130's. If you want to improve your FM communications, look at the 437S-1 Antenna.

COMMUNICATION / COMPUTATION / CONTROL



It's a cargo carrier!
It's a troop transport!
It's a staff transport!
It's a flying ambulance!



It's the Beechcraft U-21A...now in

Huge double doors and hefty one-and-three-quarter ton useful load enhance its capability as a high-priority cargo carrier. In-the-field conversion to any of its other utility configurations is quick and easy.

This remarkable versatility combines with proven dependability and exceptional performance to make the U-21A the ideal multi-mission airplane. Now in daily use, the traditionally rugged Beechcraft construction is meeting the diversified demands of urgent front-line operations.

Twin turboprop power provides quiet, efficient, trouble-free operation at both high and low flight levels. Amazing short and rugged field capability. Full all-weather dependability.

Big plane range, payload and positive "feel". Yet the U-21A will save its cost over and over again when operated instead of larger aircraft.

The worldwide Beechcraft service organization provides easily accessible parts and expert service, eliminating the need for an expensive logistic support program.

continuous production!

The U-21A is just one member of the Beechcraft family of utility aircraft. Each is built with growth potential in mind, to be quickly adaptable to meet the demands of the future. Write now

for full information, performance data, mission profiles and growth factors. Address Beech Aerospace Division, Beech Aircraft Corporation, Wichita, Kansas 67201, U.S.A.

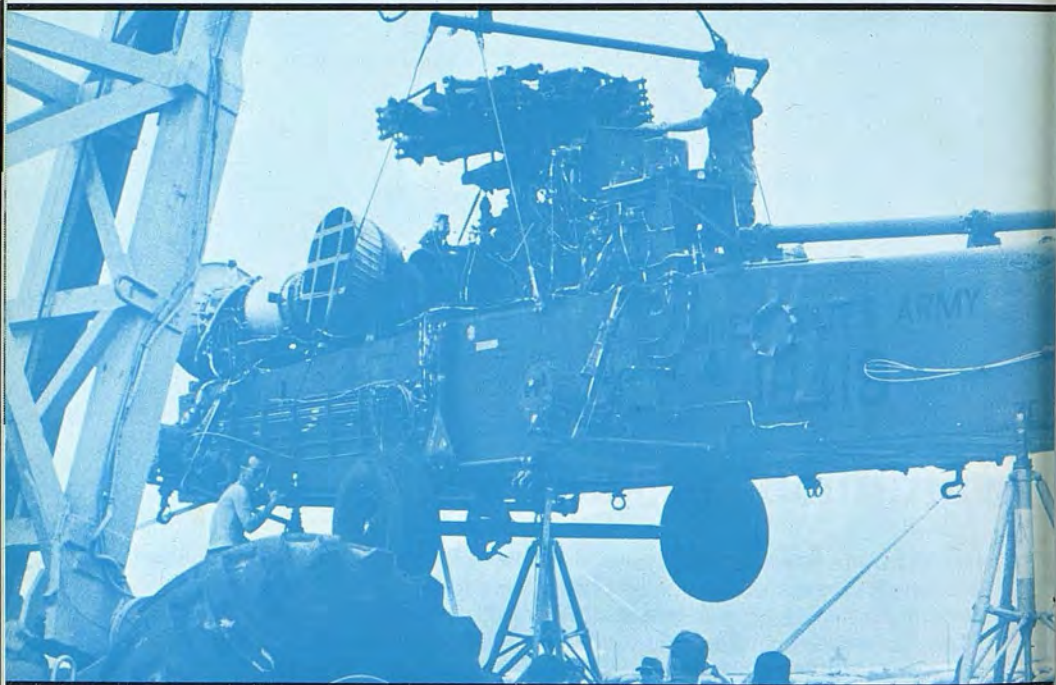
Beech Aerospace Division

BEECH AIRCRAFT CORPORATION • WICHITA, KANSAS 67201



A 14TH TRANS BN CRANE SETS
THE COCKPIT OF A NEW CH-54
"FLYING CRANE" IN PLACE AS
THE GIANT BIRD GETS MISSION-
READY ON ARRIVING IN USARV.

A QUARTER CENTURY OF PROGRESS



The General Remarks of Colonel Edwin L. Powell, Jr., Director of Army Aviation, on opening the "U.S. Army Aviation" Panel Discussion at the 1967 AAAA Annual Meeting in Washington, D.C.



GENERAL Bob Williams, who has lived every minute of the first 25 years of Army aviation, was to have been your keynote here and to have set the stage for you today.

In my opinion, he is much more qualified to do this than I who am, a relative neophyte in the program. However, the coward has retreated to Vietnam, and he has left me to fight the "Battle of the Puzzle Palace" and to represent him here and on many other podiums.

My reaction, when I first learned the composition of this panel which I had joined, and at that time we were not aware that a slight incapacity was going to prevent General Norton from being here, and I saw myself arrayed among this large group of stars, was of being a Volkswagen salesman joining a Cadillac Board of Directors meeting . . . (Laughter.)

Setting the stage

It's my mission today to review for you the last, and for that matter, the first 25 years of Army aviation. My purpose, of course, is merely to set the stage for the more substantive talks that these other gentlemen will give as they follow me.

I think it is always useful to take a look backwards to see where you've been before you decide where you're going to go in the future, and as I contemplate this first or last 25 years, I can remember some rather discouraging moments, and I'm certainly sure that there will be problems still ahead of us.

6 June 1861 . . .

However, I always say that things could be blacker . . . and they usually get that way. I am reminded perhaps, of a man who has St. Vitus dance suddenly acquiring a bad case of arthritis. Or perhaps more related to some of our business, a man who is sea sick developing lockjaw . . . (Laughter.) I would like to turn, however, to a somewhat happier subject and remind you that the 6 of June 1942 is the traditional birthday of Army aviation as we know it today, but I raise the question: *Why 6 June 1942?* Certainly the U.S. Army was associated with aviation considerably before that date.

As a matter of fact another day in June — in fact, the 6th of June in 1861 — was a very important date to Army aviation. On that date Professor Thaddeus S. C. Lowe arrived in Washington, D.C., to demonstrate a potential military requirement for Army aerial flight.

Professor Lowe had brought along with him his flying machine, a balloon that he called the *Enterprise*, and cutting channels in a very admirable manner that probably set another precedent for Army Aviators, he went directly to demonstrate his capabilities to none other than President Lincoln.

First Air OP

After he had accomplished his feat he sent the following message by telegraph from the *Enterprise* to the White House:


"Sir: This point of observation commands an area nearly 50 miles in diameter. The city with its girdle of encampments presents a superb scene. I have pleasure in sending you the first dispatch ever telegraphed from an aerial station, and in acknowledging indebtedness for your judgment for the opportunity of demonstrating the availability of the science of aeronautics in the military service of the country. (Signed) T. S. C. Lowe."

That was probably not only the first Army aviation, but it was probably also the first and undoubtedly the last day in the Washington area in which you were able to see for 50 miles . . . (Laughter.)

The other milestones

I would like to get back to the basic question: *Why 6 June 1942?* There are certainly other key milestones in military aviation after Prof. Lowe. Balloons were used again in the Spanish-American War. The Wright brothers delivered the first successful heavier-than-air machine to the Army in 1908, and in 1909 Lt. Frederick E. Humphreys took instruction from the Wrights and soloed on 26 October of that year. He could probably be called the first Army Aviator.

You are all familiar with the exploits of American pilots in World War I flying over the French countryside fighting the *Red Baron*, but this era was also the time when aviation was growing away from the Army.



Computer-directed fire control system utilizes laser beam range finder; highly magnified, stabilized sighting. Enhanced night capability planned for.

Rigid Rotor gives superior controllability in flight, solid stability as a firing platform. Design simplicity eliminates many parts, adds reliability, trims weight, cuts maintenance.

Pusher propeller supplies forward speed. Level flight: 250 mph max., 240 mph cruise. Max. rate of climb: 3,420 ft./min.

Weaponry capability includes grenade launcher, machine guns on turrets; rockets and antitank missiles; fired by 2-man crew. Rearming time: 10 min. Reconfiguration time: 10 min.

Sponsons store fuel. Cheyenne's endurance: 5.4 hr. Range: 874 mi. Ferry mission range: 2,886 mi.

26.7-ft. wing supplies lift in forward flight. Needs no control surfaces.

Cheyenne's service ceiling: 26,000 ft. Hover ceiling: 10,600 ft. Acceleration: 0 to 230 mph in 38 sec. Deceleration: 230 mph to 0 in 17 sec.

Brand new bird tries its wings

Cheyenne's maiden flight at Lockheed-California Company's Van Nuys, California plant puts Cheyenne another step closer to the day it can serve the foot soldier in battle...and is a further measure of Lockheed's responsiveness to the U.S. Army.

The first rotary wing craft ever specifically designed

as an integrated weapon, the AH-56A Cheyenne was built by Lockheed in response to Army demands for a mobile yet stable firing platform. A compound aircraft, Cheyenne will hover, take off and land helicopter style. It will fly with an airplane's speed, range and agility. And it can attack with a devastating array of

highly accurate weapons. Whether escorting helicopters, or softening landing sites, Cheyenne's mobility and firepower can add mightily to the field commander's arsenal.

Rough and ready, Cheyenne will spend more time in the air, less time on the pad. Servicing turnaround time is a fast 9 minutes.

And Cheyenne is designed to go 300 hours between inspections.

The proven ability to understand present mission requirements and anticipate future ones, coupled with technological competence, enables Lockheed to respond to the needs of this nation in a divided world.



A QUARTER CENTURY

(Continued from Page 9)

The potential of the strategic use of aviation and the growth of the bomber were the focus of aviation enthusiasts of that period, and aviation closely associated to ground forces was forgotten, even shunned. This is probably the first important thing that I have said to you since I have been up here for it is a critical point on this question of "Why 6 June 1942?"

A loss of enchantment

In the post-World War I period artillery officers grew less and less enchanted with the Air Corps support, and during the late 30's began advocating the use of light aircraft organic to the units in which they served. The Chief of Artillery about that time expressed it this way:

"The point of fall of the artillery shell is an inextricable element of command. The artilleryman cannot do his job if he surrenders this element of command to some stranger he never sees and, therefore, whom he cannot trust."

Hence, in 1940 and 1941 the Army incorporated in its maneuvers limited tests of the *Piper Cub*. The results were very favorable and enlisted much high rank support. Further testing and the impetus of a dedicated handful of people, including General Williams, led to the Army War Department Order of June 1942 that authorized organic aviation in the Artillery.

Cornerstone: Integration

I think, then, the importance of this date lies in the philosophy behind its implementation — that the ground forces have an inherent need and a right to have organic aviation to enhance their capability to do their basic mission. This is the cornerstone on which Army aviation was founded and on which we have built our program over the past 25 years. I feel that this integration and the responsiveness to ground commanders are the soul and substance, our reason for being, and our hope for the future.

World War II proved the value of organic aircraft, and few commanders felt that they

could do without it. Korea demonstrated that helicopters had value in combat, and also energized the Army's interest in VTOL. Since the Korean War, the Army has pushed the development and the use of the helicopter and has been the main proponent for new programs to explore other means of VTOL and V/STOL. The Army can be proud of its efforts in this area.

The War in Vietnam has fully justified these efforts for without the air mobility that is such a vital part of today's Army, the history of Vietnam would be entirely different.

The efforts of many

The people in Army aviation can be justly proud, also. Air mobility has been built with blood, sweat, and many tears. It is the result of the efforts of many thousands in the military and in industry. It includes the heroic efforts of the *Rogers Board*, the *Howze Board*, the *Beach Board*, the extensive tests of the 11th Air Assault Division, and untold, unnamed individuals who have contributed little by little to create the organizations, the equipment, and the doctrine which we have today.

It is important that we have reached a point in time when the greatest proponents of Army aviation are no longer the Army's aviators, but rather the combat commanders who have used aviation in the field. No one has to sell aviation to today's Army! The only question is how best to exploit the aviation technology to do the Army's missions.

A capsule view

So I think that the last 25 years can be capsuled thus: 6 June 1942 represented official recognition of an inherent need for organic aviation in the ground forces. Experience showed that this need was not limited to the artillery. Korea gave the insight to VTOL and the Army's need to exploit new technology. Vietnam has proven the concept of air mobility and has educated a new generation of commanders for its future uses of aviation.

Despite our achievements we are obviously just on the threshold of air mobility, and I am confident that the next 25 years will be as dramatic as the last.

ARMY AVIATION TRAINING

Major General Delk M. Oden, Commanding General of the U.S. Army Aviation Center, and Commandant of the U.S. Army Aviation School, reviews the several factors behind today's major expansion in the aviation training base.

ALL of you associated with Army aviation are aware of the expansion that we have undergone in the last few years. The growth of operations in Southeast Asia is well known; however, to make that growth possible, our aviator training program has increased from an annual output of 1,100 pilot graduates to reach an annual rate of 7,500 by FY 69.

Here are a few facts and comparisons to give you an idea of the magnitude of the training expansion: In FY 65, the total programmed flight hours to support training was approximately 400,000 at Fort Rucker and 158,000 at Fort Wolters. Our FY 68 programmed hours at Fort Rucker and Fort

Stewart are 950,000 and at Fort Wolters, approximately the same. These figures reflect an increase of some 550,000 hours for Fort Rucker and Fort Stewart, and approximately 800,000 hours for Fort Wolters.

In FY 65, we had 61,000 acres of training reservation at Fort Rucker. The opening of the Fort Stewart/Hunter complex raised this to approximately 346,000 acres committed to aviation training, exclusive of that at Fort Wolters. This also does *not* include the more than 400 stagefields, landing strips, and tactical sites located off the reservations.

In FY 65, the Aviation School at Fort Rucker had 478 training aircraft assigned. Fort Rucker and Fort Stewart now have 1,-

ARMY AVIATION TRAINING

(Continued from Page 13)

436 aircraft. The Fort Wolters fleet has expanded from 222 to 1,205. This represents a total increase of approximately 2,000 training aircraft.

With the expansion, management of airspace became a major concern. Through the use of a system of staggered flight periods, and by assigned training areas by both lateral and vertical boundaries, we are making maximum use of contiguous airspace, holding aircraft density to a minimum. As a point of interest, the staggered scheduling of flight periods allows launching of approximately 700 aircraft at Fort Rucker alone, throughout the entire training day, while at the same time reducing the aircraft density at any one place and time by one-half over the previous system.

Management techniques

It is obvious that a training operation of this magnitude requires improved management. Significant progress has been achieved both at the Primary Helicopter School at Fort Wolters and at the Aviation School at Fort Stewart and Fort Rucker. This requirement has resulted in the adoption of two unique systems.

First, an aircraft management system, whereby one central office maintains a daily flight hour status of all flight classes in residence by type aircraft and a complete training aircraft status which is updated every three hours. This office is staffed with a representative of each agency that deals with aircraft availability. It schedules, controls utilization, and maintains an accounting for all our training aircraft.

Our second unique system is one we refer to as the "total integrated management environment system." Although still in the development stage, it will be a sophisticated, automated management system whereby quality control of both students and flight instructor personnel is monitored. It will result in classifying and isolating the causes of student weaknesses in order to correct them and in monitoring the skill and qualification of flight instructors. The end result of these

systems is to provide more efficient utilization of both equipment and personnel resources.

Another fact indicative of our training expansion is to be found in our programs of instruction. We now have 43 active POI's. Every one of these programs has undergone at least one major revision within the last year.

Mission-oriented operations

Our current policy of orienting all of our programs to the Vietnam environment has proved very successful. During his last month of training, the initial entry student receives tactical training given by combat veteran aviators under the most realistic conditions imaginable. The student not only learns the detailed mechanics of an airmobile operation but uses simulated Vietnam procedures to include maps, radio call signs, SOI's, and organizations.

During the first twelve training days of this period, he goes through a simulated in country orientation. This is followed by eight days of field exercise in which he performs in various capacities within typical aviation organizations and undertakes missions running the entire spectrum of those he is expected to encounter later in actual operations.

The rotary wing qualification course has been changed recently to improve and expand the capability of the graduate. In the past, a fixed wing pilot attended this course and was graduated with 60 rotary wing hours, qualified only in the OH-13 helicopter. Now, he receives 77 hours, is UH-1 qualified, and receives tactical instrument training, rotary wing gunnery training and tactical flight training. This again provides the field commander with a graduate who is mission-oriented.

Commanders Course

A fairly recent addition to our programs of instruction is the *Army Aviation Commanders Vietnam Orientation Course*. Selected officers who are programmed for key assignments in Vietnam attend this course. They are given the latest information on the tactics and techniques being employed there.

Here comes the Cayuse!



When the front is fluid and the enemy is hard to find, call out the Cayuse—the Air Cavalry's new Light Observation Helicopter. It's fast (an Army pilot flew it to a new world record last year: 172.4 mph). It's extremely compact, uncannily maneuverable. Like its nimble-footed namesake, it was bred for the tough life. Needs a lot less maintenance. Flies a lot more miles on a tank of fuel. The U.S. Army's OH-6A Cayuse—from Hughes Tool Company, Culver City, California.

Hughes Helicopters



ARMY AVIATION TRAINING

(Continued from Page 14)

The course has been received with a great deal of enthusiasm by all who have attended it.

Environmental training

Environmental training has also paid great dividends in the enlisted UH-1 mechanic course in which the student now receives door gunner familiarization training. This training provides our field commanders with a qualified UH-1 mechanic who is also oriented to the total job requirement and whose in-country training is greatly reduced.

At present, we are preparing training programs that will produce fully qualified UH-1 door gunners, who, in addition, are familiarized with UH-1 maintenance. Also, as most of you may have read in the May edition of *Army Aviation*, we are developing career courses for our warrant officer pilots. This will be a PCS course having an annual input of 500 warrant officers beginning in FY 69.

Use of combat veterans

Now everything that we do in the aviation training base, both at Fort Wolters and the Rucker-Hunter-Stewart complex, if I may name that as one because that's where the advanced aviation training is being accomplished, is done with the thought of improving the caliber of graduate going to Vietnam.

INTRODUCTION — LTG Harry W. O. Kinnard (at lectern), moderator, welcomes the attendees and sets the ground rules for the question and answer period to follow the AAAA presentations. MG Delk M. Oden and G. P. Seneff, Jr., and COL Edwin L. Powell, Jr., are shown at the right.



SERIOUS MOMENT — Shown just before the start of the AAAA Annual Meeting professional sessions are, left to right, panelists MG Delk M. Oden, MG John M. Wright, and MG G. P. Seneff, Jr.

Gentlemen, my staff and I are continually in contact, officially and unofficially, with commanders in Vietnam. It is through this contact, and the creative thinking of over 2,100 combat veterans assigned at the School, that we keep our courses up-to-date and mission-oriented.

We have the most highly motivated and built-in motivated operations, I think, in the U.S. Army. Practically all of our people — all of our military people at all of these training bases — are Vietnam returnees. Everyone we're training at these bases is headed for Vietnam and knows it. Everyone who's doing the training realizes he is probably going back to Vietnam for another tour, and might serve with the man whom he's training, and here's where you get a tremendous built-in motivating factor.

I can assure you that the Schools will do everything they can to improve the opportunity of the aviator to complete his course, to do so most efficiently and effectively, to go to Vietnam as one of the finest aviators ever trained, and to do a good job once he gets there.

A 1957 USAAVNS graduate, Major General Delk M. Oden served as Director of Army Aviation in 1961-1963, leaving DA for an extended May, '63-March, '65 tour in Vietnam. The dual-rated Senior Army Aviator then served in an OPO assignment, prior to assuming command of the Aviation Center and USAAVNS in February, 1967. Born in Elgin, Texas, the affable general officer is a 1937 graduate of USMA.

THE INFANTRY- AVIATION TEAM

BY MAJOR GENERAL JOHN M. WRIGHT, JR.
Commanding General, U.S. Army Infantry Center

ARMV airmobility has now been tested in the flames of war for over two years. The vision of the original airmobile concept has been converted to reality.

Why has this new way of fighting been so successful? The obvious answer is that Army aviation has provided the Infantryman with a degree of mobility unimaginable only a few years ago.

However, this answer does not do full justice to the unique dynamics of the airmobility concept. The real reason is that for the first time in the history of warfare aircraft have been completely integrated as a principal component of the ground commander's plan of fire and maneuver.

The Army Aviator has taken his place shoulder to shoulder with the triumvirate that has ruled the battlefield through the ages — the Infantryman, the Artilleryman and the Cavalryman. In the Infantry we no longer

look upon Army aviation as a supporting element. We look upon Army aviation as an integral means of fire and maneuver as indispensable as armor and artillery.

Army aviation provides our infantry units today with a degree of mobility unequaled anywhere in the world. This creates a tactical mobility differential in favor of our forces permitting them to outmaneuver the enemy on the battlefield. Through the means of Army aviation our infantry can now fight throughout the three dimensions of the battlefield.

What does all of this mean to the infantry platoon leader and company commander?

It means he can place his unit on or near his objective tactically organized for the final assault. The swiftness of the assault by air achieves surprise and facilitates the seizure of key terrain before the enemy can recover.

At the same time the helicopter assault

INFANTRY-AVIATION TEAM

(Continued from Page 17)

avoids the tiring, disorganizing, and dangerous problems of long overland approaches through difficult terrain or through enemy positions just to get within assaulting distance of the objective. In the third dimension of the battlefield our infantry can bypass the obstacles imposed by the enemy as well as those imposed by nature. With airmobility our Infantryman is as much at home in the air as on the ground.

Organic aviation has also extended the area of influence of the ground commander many times over. It facilitates the deployment, employment, and redevelopment of his units. It permits him to keep the pressure on the enemy, maintain contact in fast moving situations, attack the enemy unexpectedly from new directions, and cut off his withdrawal, completing the destruction or capture of his forces.

A thorough blending

The thorough blending of infantry with aviation is made possible by the complete compatibility of their organizational structure. Equally as important, Army aviation has the ability to keep the artillery within close supporting range of the swift moving infantry.

No discussion of Army aviation is complete without examining its capability to provide fire as well as maneuver. Here is another example of outstanding compatibility with the infantry. As you well know, the weapons mounted on Army aircraft are essentially Infantry weapons — machineguns, grenade launchers, and rocket launchers. These are weapons that the Infantryman knows and understands.

By mounting his weapons on the helicop-



ter the Infantryman has, in effect, extended the range of his weapons and given them the capability of reaching deeper into enemy territory.

Furthermore, by mounting his weapons on air vehicles the Infantryman now has a highly mobile base of fire capable of supporting any scheme of maneuver. Today, these highly responsive fires are only as far from the commander as the handset on his radio. For unlike other supporting weapons systems, in employing armed helicopters the ground commander talks directly to the man who has his finger on the trigger.

There are other factors which contribute to the high degree of responsiveness of aerial fire support. Army Aviators live and operate in the field with their Infantry teammates. For this reason and because Army Aviators are ground trained and ground oriented they are more capable of comprehending and supporting ground operations. This face-to-face relationship between the ground commander and his supporting aviators also permits a closer integration of aerial fire support with the scheme of maneuver and with plans for other supporting fires. Because Army aviation lives and operates in the field with the supported unit, it can respond within minutes, day or night, fair or foul weather, in any type of climate or terrain.

How else does the Infantryman use Army aviation?

It carries his beans and bullets! The most brilliantly planned operation would fail without proper logistical support. Similarly, the airmobile infantry would be rendered less potent without an airmobile supply system equally as mobile and flexible.

Moving his supplies and equipment by air is a giant step towards the age-old objective of lightening the load of the Infantryman. These supplies can now be brought in by air and placed directly on position where and when needed. The need for forward supply points is eliminated in many cases as supplies can be brought forward over great distances, bypassing many echelons of command, to be deposited directly at the Infantryman's foxhole.

The airmobile supply system is unsur-



LEFT: Colonel Edwin L. Powell, Jr., Director of Army Aviation, OACSFOR (at lectern), is shown addressing the AAAA Annual Meeting audience in Washington, D.C., during the "U.S. Army Aviation" panel presentation.

RIGHT: Viewed from the rear, the morning audience hears Colonel Fabio Moizo, Director of Army Aviation, cover Italian Army operational and logistical procedures during the "Free World Army Aviation" panel.



passed in responding to emergency supply requests from frontline Infantry units. Due to the planning possible with organic Army aviation, prepalleted loads of supplies can quickly be dispatched to the most remote units.

The employment of Army aviation has greatly simplified the evacuation of wounded. But what is most important, the speed with which medical evacuation can now be effected has saved untold numbers of lives.

The eyes and ears!

Army aviation not only teams up with the infantry to fight the enemy, but helps him find the enemy. Army aviation is literally the eyes and the ears of the Infantry. In Vietnam the Army Aviator, flying low and slow, locates the vast majority of enemy targets. Concurrently with locating the enemy, the aviator detects any ground threats to his supported Infantry unit, thus denying the enemy the advantage of surprise.

To control his unit in the lightning moves of airmobile warfare the commander needs an equally mobile command post. This also is provided by Army aviation. Operating in

a command and control helicopter with his key staff members, the airmobile task force commander can bring maximum combat power to bear on the enemy. From his command and control helicopter the commander has a bird's-eye view of the battlefield, including his objective. With this advantage he is able to make better decisions, based on personal observation, and to direct the fires and maneuver of his unit.

Is it any wonder then, with all these advantages provided by Army aviation, that Army airmobility has been so successful?

You, the men who fly the aircraft and you who help make these wonderful aircraft should be truly proud of this new weapon you have forged for the defense of our nation.

I know that I speak for all Infantrymen when I say we share your pride in your past accomplishments as members of our great fighting team. We also join you in looking to the future with confidence and share your conviction that by working together, infantryman, aviator and manufacturer, we will add new laurels to our Army's distinguished record.

**FORMER 1ST AVIATION BRIGADE COMMANDER,
MG G.P. SENEFF, JR., COMMENTS ON THE . . .**

TRENDS IN ARMY AVIATION

GENTLEMEN, it is a great pleasure to be here. It was somewhat unexpected, but I am delighted that I was able to make this go-around of the AAAA Convention as I missed one recently.

I don't have to review for you in detail the tremendous build-up in aviation assets that we have seen in Vietnam over the past five years, but to run by it very quickly: in January of 1962, we had 3 aviation companies over there; in April of '65 we had 13; and in December of '65 less than a year later, we had 36. In December of '66, a year later, we had slowed down a bit, going to 40 companies and I'll touch on that later.

I'm not permitted to tell you precisely how many companies are there at the present time, but it's well in excess of the 40 that I've just cited and the number is still growing by month.

A dual rated Senior Army Aviator with over 2,500 flying hours, Major General G. P. "Phip" Seneff, Jr., served as Director of Army Aviation in '65-'66 prior to becoming CG of the 1st Aviation Brigade and USARV Aviation Officer in February, '66. Promoted to Major General in June, 1967, he rotated directly to USAREUR in October of that year to his present assignment as CG of the 3rd Infantry Division.

Shown in another way in Chart 1 are the numbers of aircraft and people that we've had in the 1st Aviation Brigade from the time that it was formed up until the very recent past. We show in Chart 3 the number of hours per aircraft which will be of some interest to you and I'll come back to that later.

Note that there has been a significant increase in the average number of hours flown. I would point out that this average is for the total number of aircraft in the Brigade. This includes the maintenance ships, the C-in-C ships that might not fly quite as much, the gun ships which don't fly as much as the *slicks* do these days, and so on.

The question of control

Now with the build-up of course, came the very great question as to how to control these aviation assets. The first headquarters that was put over them was the battalion. In the summer of '65 the 12th Aviation Group Headquarters was formed because the numbers of battalions were getting too great to control directly from USARV. The 17th Aviation Group, the second group, and the Aviation Brigade Headquarters were formed between January and March of 1966 in response to the need for a headquarters to over-

COMBAT OPERATIONS



see the assets of these continuously expanding numbers of companies and battalions. Brigade Headquarters was provisionally acti-

many problems connected with it, it was felt that a certain amount of centralized command was desirable to handle the myriad of details that the operational commander is not concerned with or doesn't want to get concerned with. So we've had this split in command functions that have become a way of life in Vietnam.

CHART 1

GROWTH RATE — 1ST AVIATION BRIGADE

Date	Acrft	Co. Units	Strength
Mar 66	983	36	10,900
Jan 67	1,020	36+	—
Aug 67	1,400+	40+	16,000+

vated in March of 1966 and formally activated in May.

What was the job of the Brigade Headquarters? Well, this impinges pretty heavily upon philosophy of Army aviation, how you make the aviation units fully responsive to the needs of the ground commander, to what degree do you centralize the exercise and so on. You've all heard our arguments on this, counter-arguments, Air Force arguments, and so on over many years.

It was recognized basically that the aviation elements had to stay at the lowest possible level from an operational point of view in order to get the job done, i.e. to be fully responsive to the ground commander that he was supporting. On the other side of it because of the rapidity of the build-up and the

The headaches of command

The operational ground commander, the division commander, the brigade commander, and so on have full operational control of all the assets of the Aviation Brigade. The only aircraft I really owned were the ones I had in Brigade Headquarters. All the other aspects of command were my headaches, and the headaches of my brigade commander or my group commanders and my battalion commanders.

If you want to look at it another way, we had all the worry, sweat, and headaches of the business, and the operational commander had all the fun, and that is truer than it might sometimes sound.

We played a fairly strong administrative role in trying to take care of our people, in keeping our people sorted out, and in making adjustments as new companies came in to make sure that one company wouldn't turn

COMBAT TRENDS IN AA

(Continued from Page 21)

into a pumpkin overnight because all of its people had gone home at the end of their year. We processed, of course, fantastic numbers of awards and decorations, primarily because of the Air Medal, and we had the normal administrative worries that any commander in any organization has got.

In-country training

We had a heavy training role to make sure that our people were trained properly after they got in the country, and I'm not throwing any slants on the Aviation Center here for they're sending us magnificently trained people, but obviously there are a few things that they can't give them even there, and we do have to keep training up in the field.

It's not an easy thing to do because the people are flying more in trying to get the job done than anyone has ever believed possible, and there is not much time left for them to train as such.

We had strong standardization programs going, not in terms of flying standardization—we had that too—but in terms of standardization of doctrine, techniques, tactics, methods of operation, and so on. Understandably enough, the elements in different parts of the country in many ways were doing things in different ways. If you took a company from the Delta and plugged them in in the highlands, you would find that their SOPs were quite different. Well this we couldn't live with and retain the degree of flexibility that we needed, so we started early in the game with the help of part of the "old team" from the 11th Air Assault that General Kinnard very kindly let me steal from the 1st Cav Div to bring down to my Brigade Headquarters and then start work on this sort of thing. He gave us some good people, and it hurt him to do it but it certainly helped us.

The shifting of forces

We exercised a fairly strong planning role in large operations that required the shifting of significant assets from one end of the country to the other. For example in Opera-

tion *Junction City*, we got one battalion with five companies from *1 Force V* and put them in support of *Junction City* and two companies from the Delta for a 4 or 5 day period to help kick that operation off. This will grow more in the future.

We haven't been able to shift assets around very much because we were somewhat limited in what we could take away from people and still enable them to do their job, but I think that I can very safely say that in future operations it will not be uncommon to see 20 Assault Helicopter Companies with 220 to 240 *Hueys* and six, eight, or ten *Chinook* Companies put behind a single division for a single day in order to throw them in quickly, and to gain better surprise than they've sometimes been able to obtain in the past.

The broad disposition

Logistically, we were somewhat out of the pattern, except for the brush fires, and the brush fires kept us very well occupied. Again, without being unkind to our friends in AMC who do a tremendous job in supporting us, there were many things that dropped through the cracks, and these seemed to keep us fairly well occupied from time to time. As you know, we're spread out from one end of the country to the other. Chart 2 shows the general layout in Vietnam, the countryside itself, place names, and the locations of the major ground elements in the country. As you know, every Infantry Division has an Aviation Battalion of its own, and the 1st Cav, of course, had a very fine aviation setup of its own. These were under complete command and operational control of the elements to which they belong, but the rest of the combat aviation units in the country belong to the 1st Brigade, and they were disposed in country as is shown on the chart. The 17th Aviation Group is the one in the north and it's under the operational control of *1 Force V* (*1st Field Force Vietnam*). The 12th Aviation Group, located just north of Saigon in Long Binh, is under the operational control of *2 Force V*. The 17th and 12th Groups actually were pretty close to being equal in overall size, 12th Group being a little bit bigger and the 13th Battalion in the Delta, the good old Delta Battalion under



RECONNAISSANCE ... a very special ART

ATI's passive defense systems are employed on reconnaissance missions flown by the Army Mohawk.

If you have a problem in the field of defense electronics, call ATI.



Applied Technology develops and fabricates electronic reconnaissance, surveillance, and active countermeasures systems. Because of a strong scientific and engineering team of specialists, ATI has secured an enviable reputation for creativity, equipment reliability, and extremely quick reaction to customer needs.

APPLIED TECHNOLOGY

A Division of
Itek Corporation

3410 HILLVIEW AVE. • PALO ALTO, CALIFORNIA • 94304 • PHONE: (415) 321-5135 • TWX: 910 373-1218
Lincoln Air Park West, Lincoln, Nebraska: (402) 799-2411 • Washington, D. C. Office: (703) 532-8188

ATI is an equal opportunity employer

ELECTRONIC WARFARE SYSTEMS • MICROWAVE COMPONENTS • SPECIAL COMMUNICATIONS • AIRCRAFT MODIFICATION

They stake their lives on "Little Joe"

that's what Army fliers in Vietnam
call the tough, reliable Titan gas
turbine APU that cranks up the big
Chinooks without ground support

Solar's *Titan*® gas turbine is a compact, light-weight APU which generates electric and hydraulic power aboard the Army's Boeing-Vertol CH-47A Chinook helicopter. The unit starts the Chinook's main engines and it provides auxiliary power for servicing anywhere in the world without ground support equipment.

More than 1,500 of the 80 to 150 hp *Titan* turbine APU's have been sold and are in use in every military cargo helicopter program. Their reliability has been proven by years of service in the field under the most rugged combat conditions, including temperatures ranging from -50°F to $+121^{\circ}\text{F}$, and exposure to salt water, dust and sand.

The *Titan* gas turbine weighs 75 lbs and is 25 inches long and $12\frac{1}{2}$ inches in diameter. *Titan* gas turbine APU's may be equipped with alternators, generators, hydraulic pumps, pneumatic compressors or any combination of these units.



80 hp Solar
Titan gas turbine



For more information about the *Titan* gas turbine, write: Solar, Department Q-110, San Diego, California 92112.

SOLAR

DIVISION OF INTERNATIONAL HARVESTER COMPANY

COMBAT TRENDS IN AA

(Continued from Page 25)

number of lifts going within a division, the 1st Aviation Battalion and the 1st Division again would take one; my people would take the next; and they'd just switch back and forth. Same frequencies, call signs different, but using the same bird throughout the day, and we developed in this a pretty flexible way of going at it.

Statistics are always a bore, but I'd like to give you a few anyway for FY 67. Hours flown: I thought we were going to break a million hours, but we didn't quite do it—933,189. Troops transported: 3,940,299 or almost four million. Evacuation of wounded: 2,170 and that's in Brigade birds, not medevac birds for they did not belong to me. VC killed by helicopter: 9,413. I don't want to belabor this point, but that's higher than the body count of any division in Vietnam. Structures destroyed and sampans destroyed: almost 6,000 of each.

The vulnerability rate

The vulnerability rate actually has improved over the past year or so. Now I'll have to treat this one with a grain of salt because I'm not really sure whether the vulnerability rate has improved, or whether we finally have gotten people to admit that an accident is an accident, instead of trying to label it as a combat loss, so any real charting of this is a bit difficult at this point in time, but those statistics are very, very good from the vulnerability point of view.

One aircraft hit per 746 combat sorties; one shot down for 9,692 combat sorties; and one "total aircraft" loss for slightly over 25,000 combat sorties. I would maintain again as I have at times in the past that I think that kind of a batting average is a lot better than you get on the Freeways around Los Angeles, and personally I feel a lot safer in a chopper in Vietnam than I do on one of those roads.

The killed rate and wounded rate are similarly very good. Now this is very meaningful to us, because what it's doing for us aviation-wise in Vietnam, as we said before, is providing a tremendous training ground for young aviators. It's not so dangerous or

so grinding into the ground as was World War II that we're losing tremendous numbers of good people. On the other side of it there's just enough danger in the air to tend to make people try to do the job properly most of the time.

I mentioned earlier that we had a slight lapse in the feed-in of aviation assets during the year calendar '66 which, of course, was the time of the tremendous buildup in ground forces. The American ground forces in Vietnam more than doubled during that calendar year, but we got a very small increase in aviation assets to go along with it. This is completely understandable for the production rate of pilots, birds, and everything else lagged considerably in keeping up with the game.

160 flying hours a month!

Now what does this translate into? In December of '66 we suddenly found that our people were flying in aircraft much more than we ever had before and in reality we began to find out how much they *could* fly. My first indication of this was in the 52nd battalion, where in that month we had ten people fly in excess of 150 hours, and most of them were up around the 160-170 level, which was somewhat unprecedented even over there and made us start to worry a good deal.

We did institute some controls, the primary control being that we have now said that no one can fly more than 140 hours in a 30-day period, i.e. 30 consecutive days, without getting stood down for 3 days. After he gets his 3 days *stand down* he starts flying again.

Now what this has done for us in terms of averages within the brigade are pretty well reflected in Chart 3. Now I wanted to

1ST AVIATION BRIGADE UH-1D & H FLIGHT STATISTICS AUGUST, 1967

Average per aircraft	91.2 hrs
Highest (174th AHC)	145.5 hrs
Average per pilot	90.0 hrs
Highest (174th AHC)	107.0 hrs

Bendix helicopter radar.

Fly more. See more. Do more.



The Bendix AN/APS-113 radar is expressly suited to the demands of military helicopter pilots.

It produces stronger images from the less dense weather targets of monsoons and smaller storms. Special contouring circuits clearly define the storm's interior. Even when close-in weather makes strong radar echoes. And it sees the storms behind the storm for marginal information—so vital to copter pilots for skirting trouble. And completing missions.

Available with either 8- and 40- or 20- and 80-mile sweep ranges, the Bendix AN/APS-113 also offers superior navi-

gational assistance. Lets pilots fly more precisely. Expands night and low-visibility operations. Improves surveillance and target spotting, both day and night. Reduces critical search and rescue time, too.

A flip of the switch and the AN/APS-113 turns into a high-fidelity terrain mapper. With outstanding definition of coastlines, deltas, landfalls, even shipping hazards and landmarks.

Fly more, see more, do more with the Bendix AN/APS-113. For details, write: The Bendix Corporation, Avionics Division, Baltimore, Maryland 21204.





Bell *JetRanger* available now for military missions

Turbine-powered JetRangers are now in quantity production... leading the commercial light-turbine market by a substantial margin. They are being delivered on schedule — in the Bell tradition — to discriminating commercial customers throughout the world. □ The JetRanger is qualified as an Army instrument trainer and can perform many other military helicopter missions. Like the famous Bell Huey the JetRanger offers high reliability, ease of maintenance and outstanding maneuverability. □ With produc-

tion expanded to meet unprecedented commercial acceptance, U. S. Military requirements can be met with minimum lead time.



BELL HELICOPTER

FORT WORTH, TEXAS 76101 • A **Textron** COMPANY



Army Aviation

DEC.-JAN. PHOTOS



HEIDELBERG — LTG John A. Heintges, Deputy Commander-in-Chief for Seventh U.S. Army, listens as MAJ Edward H. Miller, Commander of the 14th Aviation Company explains a communications relay panel. The general officer received a complete briefing during his visit to the 14th's Flight Operations Center. The men of the 14th Aviation Company have no aircraft and need none, being kept busy keeping track of everyone else's in providing the only Army Flight Following Service (FFS) outside of the Republic of Vietnam.



LOS ANGELES — Representing the personnel of the 175th Assault Helicopter Company, U.S. Army, Vietnam, SFC Bertsy M. Goodson is shown accepting the Annual NDTA award singling out a unit in each service for outstanding and valorous service in the field of military transportation and logistics. Commanded by MAJs Richard Leister and Roger La Course during the awards period, the unit was cited at ceremonies held in late '67 in Los Angeles.



FT. EUSTIS — CWO Willie H. Windham (right) receives a certificate denoting CH-47 qualification and completion of temporary CH-47 pilot training at Ft. Eustis. LTC Charles A. Morris (left), chief of the T-School's Tandem-Rotor Transport Branch, and MAJ Edwin R. Widmer, chief instructor pilot, congratulate Windham, the first AA to qualify under the temporary program.

AN KHE — An aviation "first" was completed successfully in mid-Dec. when two CH-54 Flying Cranes assigned to the 478th Aviation Company (HH) each lifted a pair of helicopters from Chu Lai to An Khe for overhaul. One Crane lifted a Huey and an OH-13; the second, two Hueys that were attached side-by-side. Crews included CWO Robt. Carlisle, Teddy Jenkins, and James L. Daily, and Sp5 James E. Drinkwater; and CWOs Merlin J. Handley, Lester C. Havenfield, and William H. Ruffin, and Sp6 C. J. Gargulia.



RESUPPLY AT DAK TO



show you the worst picture on this obviously so I confined this to *slicks* — the Deltas and the “H” models that we’ve got over there because they are flying considerably more than other aircraft or other people. The average hours per aircraft in the brigade — *slicks* only — is 91.2. The highest, the 174th Aviation Company, the Dolphins who are with *Task Force Oregon*, and who work most closely with the 1st Brigade of the 101st Division, put 145.5 hours average on their *slicks* in August of this year, which is almost unbelievable. The average time per pilot was 90 hours, and again, the highest was the 174th with an average amongst the slick drivers of 107 hours. Now this includes the company operations personnel, company commander, exec operations officer, etc., so it’s not a precise reflection of what was happening to the individual, i.e. the day-in and day-out cockpit pilot, and they in that company in that month were right on the 140 hour mark across the board.

This is not something exceptional in Vietnam now — it’s a way of life. What we’re learning really, I think, is how much people can fly in a chopper. Flight surgeons and commanders keep a close eye on them; they are holding up well; they do seem to be able to stand it. In fact, most of them prefer this

to not being able to fly, and it’s reached a point where people begin to squawk if they only get 100 hours in a month because they have to spend too much time sitting around a bar or something. They’d rather fly to keep themselves occupied.

Now, I said I’d say something of the fact that we thought we were pretty good, and I didn’t. The members of the 1st Aviation Brigade, and this is not because they belong to this brigade above any other or anything of this sort, but it’s because they’re superb young people — really tremendous people. The young warrants that we’re getting are better motivated than any bunch of people I’ve ever seen in my life. They’re bright-eyed, bushy-tailed, eager and never anything less than 200 percent willing.

A measure of progress

They perform incredible feats day-in and day-out. Some of them get recognized for it; you could never recognize *all* of them for what they’re doing on a daily basis for they’re doing a tremendous job. You simply don’t get squawks from ground commanders on the support they’re getting from these companies in Vietnam at the present time.

I was probably getting through brigade headquarters ten to twenty letters a month

COMBAT TRENDS IN AA

(Continued from Page 31)

of appreciation from battalion commanders and company commanders on the outstanding job that some outfit or some man had done for them. Over a drink at night I heard two infantry brigade commanders arguing with each other about whether the *Robin Hoods* or the *Vultures* were the better helicopter company, and when you get infantry brigade commanders arguing about what they're getting out of an outfit *that doesn't belong to them*, you have made a certain amount of progress.

The future . . .

So, these gents are proud of themselves for they're doing a terrific job and it is thanks to most of the people in this room and a lot of others who are at this convention that they're able to do this job, because you're the people who have motivated them, built them up, trained them, equipped them, and everything else that goes along with it.

What does the future hold? I think we'll continue to see some growth out there. I can't go into it in detail unfortunately, but I can assure you that the general methods of operation will stay the same, and the performance will stay the same.



MG G. P. Seneff, Jr., at lectern during his presentation at the 1967 AAAA Annual Meeting.



GENERAL Norton was to be here with you today and had to cancel out. He asked that I pass on to you his best wishes and the word that he is still fighting his way back up. My remarks will be in essence what General Norton would have said to you, and I know he was looking forward to being with you on this 25th Anniversary of our Army aviation.

Looking back over the past 25 years, there can be no question that logistics support of our Army aviation has made tremendous progress, particularly within the past decade after the time we assumed depot responsibilities from the Air Force.

Today, we find that we have a complete responsibility and, I think, a proven capability for engineering, research and development, procurement, production, maintenance and overhaul, and certainly, last but not least, the supply support of our aircraft and supporting systems.

While our logistic support looks good on

A graduate of the "Class before Class One" in early 1942, a Master Army Aviator, and a combat veteran of WW II, Korea, and Vietnam, Colonel Delbert L. Bristol has held a variety of staff and command assignments within Army aviation, to include command of the 10th Air Transport Brigade in US-ARV, and a tour as Deputy Director and Director of Army Aviation.

*Management innovations, and a desire
for constant improvement mark the . . .*

LOGISTICS SUPPORT

OF ARMY AVIATION

A Presentation by Colonel Delbert L. Bristol, Deputy Commander, USA Aviation Material Command

the battlefield in Vietnam, this is no time for complacency, since we are for all practical purposes today living on an air pipeline to Vietnam. In Vietnam, we find the 34th Group completely responsible for the supply and maintenance support, not only of the aircraft and the engines, but of the avionics and the weapons as well. Here at home in CONUS, we find many agencies involved in supporting our aviation in AMC as well as within the Department of Defense.

Room for improvement

While there are good working relationships between project managers, commodity commands, and defense supply agencies, there is still much room for improvement in the management of our day-to-day logistics support, and I want to assure you that General Norton and the staff at AVCOM recognize this and are working on it to the best of our ability.

In order to improve our immediate support in Vietnam, we have had two recent management innovations that I would like to just highlight for you. The first has to do with the requisitioning of supplies for selected aircraft systems. In the past we followed the normal Army system of echelon to echelon and found that we really just

weren't cutting the mustard, particularly when the supply situation got tight in the build-up that General Seneff has just talked to you about.

So instead of the past procedure, we introduced a new procedure in which the 34th Group requisitions, instead of requisitioning upon each supply agency which within AMC is about eight commodity commands, and then you throw in the Defense Supply Agency and the General Service Administration.

Direct requisitioning

The 34th Group now requisitions for selected systems *directly* upon AVCOM, and for those requisitions that are for items that are not our responsibility, we pass them to the appropriate supply agency. But we follow up on this item to be sure that they fill it within the required time. If they don't, we take an item off the production line or we go out and buy it ourselves. Now today this system is in effect for the CH-47, the CH-54, the OH-6, and the U-21 aircraft systems. We have tested this for more than six months on the CH-47 helicopter and our experience shows that it does improve the effectivity of the supply to the 34th Group.

The second management improvement ac-

LOGISTIC INNOVATIONS

(Continued from Page 33)

tion that I think warrants discussion here, concerns the reporting on the status of repairable components. About four years ago, we had a good system I'm told, and I believe it was true, where we did report serial numbers of engines and that sort of thing. Then we got mixed up in a new system called TAERS which today just doesn't give answers that are meaningful to supply managers.

Postcard reporting system

So last February when we got into a real tight situation on T53, and T55 engines, we instituted a special "postcard reporting system," and this keeps track of engines when they go through Travis AFB on out to Vietnam, when they get on down into the units, when they get installed on an aircraft, when they're unserviceable and when they come back. So far this reporting system has proved quite effective.

In addition to that, on the monthly aircraft status report which we call a 1352, we required those units that had T53- and T55-equipped aircraft to report the serial numbers of the engines, as well as the time on them. Now out of this has come the intelligence which was lacking for almost four years that I believe will point the way — certainly in this area — for us to provide better support to the field. We are now in the process of extending this type of reporting system to other major high dollar value items.

Use of ADPS

At AVCOM, I believe we have a real good management system which blends together the efforts of the project managers and of our functional managers through the medium of an automatic data processing system (ADPS), and just as a matter of information for you, 75 to 80 percent of the requisitions that come into AVCOM go through that system automatically without really being touched by human hands.

Now in the event you get suspicious of this, we have a "spoof" operation which is under the leadership of Mr. (Eric) Petersen here in the front row, which de-bugs this

system on a regular basis to be sure that we are in fact getting out of the machine what we expect.

Our current AVCOM problems center on the return of reparables from the field. Delays in shipment, improper preservation, and packing continue to plague the supply system. As one example, just take rotor blades alone. We are spending in excess of fifty million dollars each year for replacements for our rotor blades. Of course, we are working on this and I know that the people in Vietnam are working on it, but this just gives you an idea of one of our current problems.

The next item that General Norton wanted me to touch upon for you was based upon his experience with the 1st Cavalry Division which he left last spring. He is very strong in his observations that all, and I'm instructed to repeat *ALL*, combat commanders at battalion, brigade, and division level must emphasize the maintenance of aircraft, as well as being able to fight and secure their aircraft. And I think this is the same experience we've had in armor and artillery in past warfare, when you relate the fact that in the type of operation that you have in Vietnam where people are so dependent on aircraft, they must give the attention to maintenance of their aircraft in order to assure the day-to-day availabilities that they want.

A growing maturity

Now looking to the future, there is one item that I think is worthy of note here today; the Army has just been assigned responsibility as the DOD integrated manager of the UH-1 helicopter system for all three services, and I believe this to be further recognition of our growing maturity in aviation logistics.

In closing, I would like to quote from General Norton's prepared text his closing remarks, and I quote: "Of two things I am certain, first Army aviation will continue to grow and improve the tactical capability of the U.S. Army. Secondly, we must continue — all of us — to seek and find better ways of providing for the logistical management of our tactical fleet. I predict that more of you will be required to serve on our logistics team."

Summing up as AAAA panel moderator, LTG Harry W. O. Kinnard, USACDC commander, asks that we consider . . .

Aviation as a System

AS we start the second 25 years or second 100, whichever it is depending on how you count the (Civil War) balloons, I suppose that all of us could try to play Nostradamus. I don't pretend to do that but I do have a few observations that I would like to make that seem to me to be at the heart of what we should be trying to do in Army aviation as we go on from here.

I think that one of them perhaps relates to the job that I have right now in Combat Developments Command. It's become crystal clear that we can no longer look at single weapons or single anything. We look at

families of artillery weapons, and we look at families of tank anti-tank weapons, and so forth. Similarly, it seems crucial to me that we take this same kind of a look at the family of Army aircraft.

Now we've taken this kind of look at times in the past with the *Rogers Board* and others, but I think that we have to keep this family in mind very carefully, rather than think in terms of a replacement for this, that, or the other, and *that* is the kind of look I can assure you which we in Combats Development Command intend to take.

Army aviation as a system

In addition, I think that we have to increasingly consider the entire Army aviation effort *as a system*. I think we have to be very careful and do better than I believe we have even so far in being sure that the peripheral things come along with the main items, and I have in mind such things as the Pathfinders with their organization equipment and systems, the traffic controllers, the lightening of the weight of our aviation logistics, and

The senior Army Aviator in the Army, LTG Harry W. O. Kinnard commanded the 11th Air Assault Division at Ft. Benning, Ga., during 1963-1965, leading that division into combat in Vietnam as the newly-activated 1st Cavalry Division (Airmobile) in September, 1965. Later assignments as Deputy CG of I Field Force, Vietnam, and Deputy ACS-FOR, DA, preceded his current assignment as USACDC.

AVIATION AS A SYSTEM

(Continued from Page 35)

that sort of thing. This is not a new thought. All I'm saying is that I believe that it's going to become increasingly important.

I think as we take this look at Army aircraft, we have to be extremely wise — as wise as we human beings can be — and as farsighted as we can be in measuring the trade-offs between increasing performance which all of us want, and the complexity and expense that inevitably goes along with it. There is obviously no simple answer, and obviously again, this is not a new problem, but I think it's one that gets increasingly tough.

Beat your "branch" drum!

I believe that Army Aviators more, not less, need to think in terms of their basic branch as well as the fact that they're Army Aviators. I think that the Vietnam war has proven among the many other things that it's proven, that the idea that a man is an Infantryman as well as being an Aviator or Artilleryman and so on makes eminently good sense, and I think we find that it works both ways: that the man who is a good Infantryman, if he's an aviator is also a very good flier, and he's a *better* flier by virtue of the fact that he is a good Infantryman.

But the whole idea of getting your branch more and more interested in aviation, it seems to me, takes on increasing importance. Maybe you can do it by coaxing and cajoling or maybe you have to drag them screaming into the 20th century, but whatever you have to do, I believe it *must* be done with respect to your branch.

General Wright has spoken in terms of the infantry — I think if you're an armored type you'd better be sure that all the armored

types are getting up to date and up to speed on aerial cavalry, because I think it's here to stay and in a very big way. If you're an artilleryman, I would suggest that you make it crystal clear to all artillerymen that aerial rocket artillery is really here to stay, and they'd be well advised to learn a great deal about it. So I simply invite you to keep beating the "branch" drum, but with a strong aviation flavor.

I think it's important that we do our best to look ahead to expanded uses of Army aviation, and maybe you can come up with a better list than mine, but some of the things that occur to me are increased ability to operate at night, increased ability to operate in marginal weather, increasing capability to operate against sophisticated anti-aircraft weapons systems of the *Red-Eye* type or radar-controlled guns, or what have you.

It seems to me that we simply have to stay ahead of the power curve in all of our thinking about the new aircraft and in our approach to our design work we must be thinking in terms of Army aviation that's up against tougher and tougher problems, and it's doing more and more.

The key to progress

I would add to that thought that I personally believe that as the assets in Army aviation become available — when the Vietnamese war is over — that we can do a great deal along the same lines that was done by the 11th Air Assault Division. To me the idea of a development of techniques and tactics and organization and equipment and doctrine that goes along on a broad front and in complete harmony is really the way to make progress.

The sort of thing that I would visualize, for example, would be the introduction in Europe of enough aviation assets over there — the idea of air cavalry units using the most sophisticated anti-tank weapons and so on. We should actually try those out in a place like Europe. So all I'm saying is that the next twenty-five years are going to be just as interesting, and perhaps more challenging than the last twenty-five, and I wish I were going to be around for all of them. I look forward to the few that I will.



QUESTIONS AND ANSWERS

FOLLOWING "U.S. ARMY AVIATION" PANEL PRESENTATIONS

PARTICIPANTS: LTG Harry W. O. Kinnard, CG, USA Combat Developments Command; MG Delk M. Oden, CG, USA Aviation Center & Commandant USAAVNS; MG John M. Wright, CG, USA Infantry Center; MG G. P. Seneff, Jr., former CG, 1st Aviation Brigade & CG-Designate, 3d Infantry Division at time of panel; COL Edwin L. Powell, Jr., Director of Army Aviation, OACSFOR, DA; COL Delbert L. Bristol, Deputy Commander, USA Aviation Material Command.



■ **QUESTION FROM FLOOR:** If we double the rate of flying, i.e. double the flying effort as was described by General Seneff, we must also double the amount of spare parts we use. Now were the operators able to warn the logistics experts that this was going to take place or did it just happen, and could logistics keep pace with the extra flying effort?

■ **GEN. SENEFF:** Well, I won't say that we were really able to warn them, but they have been able to keep up with us as is evidenced by the fact that our EDP rate, i.e. **down rate because of parts**, is lower in Vietnam now than it's ever been. Now we are still continuing to increase the amount of overflying to some extent, and whether the Aviation Directorate will be able to continue to match us for the rest of the time, I don't know, but so far we've had no requirement for rationing flying hours as such.

■ **GEN. KINNARD:** I'd just like to add that as a combat commander with a lot of aircraft that one of my principal decisions was always how far to push the aircraft today in view of the requirements for tomorrow. I think that this will always hit you on a surge basis that you may quite often have to run them well beyond what you'd like to, but knowing that you're going to have to pay the piper next week or next month.

■ **COL. POWELL:** As part of our long range programming, we developed what we call a "**flying hour program**." This is developed on a building block concept, and it's based upon various categories of aircraft in various functions and the inventory of those aircraft in the various parts of the world. We project what we anticipate the rate of requirement is going to be; we project what the inflow of additional aircraft into Vietnam, for example, or into the training base is going to be, and on this basis we develop these flying programs.

We are presently developing the **Flying Hour Program for FY71 and FY72**. Now admittedly, a great deal of assumption goes into this, but we have to be flexible and so we develop alternate plans. For example, we develop plans on the basis of various assumptions as to what the training rate will be in numbers of pilots to be turned out. A basic assumption is "Will there continue to be combat in Vietnam, or will it have ceased?"

But with these basic assumptions and alternate plans, we build up these flying hour programs, and we get up into figures of between 5 and 10 million flying hours per year. These are then used to determine the budgets for fiscal years in the future.

QUESTIONS AND ANSWERS

(Continued from Page 37)

For example, the **FY70 Flying Hour Program** is being used at the present time to develop the **FY69** budget for what we call **PEMA** secondary items. These are the long-lead time major components like engines and transmissions which will be available in the **FY70** period, but which must be ordered with **FY69** money in order to support the flying which we anticipate will be done a year later. I think Colonel Bristol can probably tell you how well we have done along all the way. He's got problems, I know.

■ **COL. BRISTOL**: Actually, there are practical aspects to what General Seneff presented to you. He presented some flying averages for his units, and then he presented the unit that was well above average. When you look at it from the **CONUS** point, the averages have more meaning to us than they do in the combat theater, and then when you consider that every three months on the long-lead items we are reviewing those items for new buys and so while we might hit a period of time where we could have a tight supply situation, you can respond to increases in flying hours just as you have to respond to decreases, provided of course, people give you the money on time... (Laughter.)

■ **GEN. SENEFF**: I should point out that those Brigade averages, of course, are much higher than the average across the board in country because you've got many aircraft on the medivac role, in headquarters outfits, in engineer outfits, in artillery outfits, and so on that aren't beginning to do that much flying. Actually, the average of all the **Hueys** in Vietnam, for example, is in the vicinity of about 70 hours per month, and they had programmed for this long ago.

■ **COL. POWELL**: I think the most significant thing about the figures which General Seneff displayed were that since the parts were available, and since the people were there to utilize the

parts, the aircraft were able to be kept in the air. This breaks down the argument that there is a measurable maximum to which the aircraft cannot exceed in its ability to fly. If you provide the parts and you provide the people to maintain them, we haven't found out yet what the limit is.

■ **GEN. SENEFF**: Yes, and I left the availability rates off that chart, but again, using the **Huey** as a standard, our **Huey** combat serviceable availability was running about 73-75 percent on the average, day-in and day-out. This, of course, took good maintenance crews, and they did all their work at night. They jumped on them when they came home at night and worked all night long, if necessary, to get them going for the next morning.

■ **GEN. KINNARD**: We didn't give you an answer; we gave you a five-foot shelf!... (Laughter.)

■ **GEN. WRIGHT**: I'd like to get in on this one, too. I've argued — I don't know how effectively — that the **Flying Hour Program** should be a tool for the logisticians and the top-level managers, and that a commander in a field shouldn't even know what the **Flying Hour Program** is. He ought to be able to fly as much as he needs in order to accomplish any tactical mission... (Applause.)

■ **COL. POWELL**: May I add to that?... (Laughter.) We establish a **Flying Hour Program** for budgetary purposes. Because there are shortages in certain critical components, we have to live within that **Flying Hour Program**. But as far as Vietnam is concerned, all we do is ask them how many hours they're going to fly and we adjust the rest of the world to make sure that they're able to fly that much.

■ **GEN. SENEFF**: Thank you very much!... (Laughter.)

■ **GEN. KINNARD**: That must be all to that answer... (Laughter.)... I don't see any hands. General Howze?

■ **GEN. HAMILTON H. HOWZE, USA (Ret.)**: This question goes really not beyond, but rather off the subject of your

FPPP ENROLLMENT PERIODS

Effective March 31, 1968, enrollment for the AAAA-endorsed **Flight Pay Protection Plan** will be conducted during two one-month enrollment periods in each year.

Applications will be accepted from company grade officers, warrant officers, and enlisted members during each March 1-31 and September 1-30 period.

Enrollment will be open to a limited number of field grade applicants during March 1-31 of each year.

As in previous years, an individual's flight pay insurance coverage would commence upon the first day of the month following the postmark month of his enrollment.

LADD AGENCY, INC.—1 CRESTWOOD ROAD—WESTPORT, CONNECTICUT 06880
PROVIDING INSURANCE TO OVER 4,600 ARMY AVIATORS AND THEIR FAMILIES

QUESTIONS AND ANSWERS

(Continued from Page 38)

panel, but nevertheless it might have some interest. I wonder what you would think of the idea of storing or mothballing aircraft in the period which may exist in between wars.

Our country has historically torn its military forces apart as soon as the shooting has stopped. It would seem to me in view of the fact that the production lines have already been slowed down in anticipation of the stopping of the Vietnamese war—at least that is presumably in part the reason that they've been slowed down—it would seem to me that there is at least a possibility that further development of new aircraft might stop as of the time the Vietnamese war stopped, by reason of the fact that the inventory would be fat.

One solution to this might be in actual fact the mothballing of aircraft out in the desert areas in order to keep them against their use in another war. Now it's quite true that the next generation of aircraft will be better than the present generation of aircraft, but it is hard to believe that the UH-1 and **Chinook** type and the Sikorsky **Flying Crane** and other stalwarts of Army aviation might not, even in a war fought in 1980 or 85 or 90 be able to do, perhaps not the front line job, but nevertheless a very useful job for the Army.

Assuming that the funds could be made available, and this is a very big assumption, would it not be a right

course of action for this country not to inhibit the production of new aircraft by reason of the fact that your inventory is already fat, but rather store those aircraft against the need which will be greater than your inventory will be as of the time a new conflict starts. If anyone has any ideas on that I think it would be an interesting discussion.

■ **COL. BRISTOL:** The only disadvantage that I see toward that type of solution is the on-going support for that type of aircraft. In other words, once an aircraft goes out of production, you've got one phase you're entering and you are still continuing to produce parts while it's still in active service, but if it goes beyond that stage there's a point at which you cut off, it's no longer economical or even reasonable to keep a manufacturer ready to produce parts for something if they have gone too far in their service life. I would certainly vote for a shorter cycle from what I've seen; in other words, from the days of ten years ago when I thought we could live with a family of just six aircraft, I've now learned that 33 is a surprisingly small number to have in the Army today. We can be thankful that we do have some duplications in the Army, because now and then we run into problems such as Vietnam where we were going to have pure fleets, but the numbers of aircraft required just ran away from us and we had to mix them, because we had to use other models for support.

■ **GEN. HOWZE:** I think your point is valid, but a partial answer to that is these aircraft are going to be flying—the ones that you're buying now are going to fly another ten or twelve years, would you not expect?

■ **COL. BRISTOL:** Yes, sir!

■ **GEN. HOWZE:** And this being true, you'll have to provide them with parts anyhow.

■ **GEN. BRISTOL:** Yes, sir, and, of course, during this time I don't see that point at which the Army will reach its inventory requirement. Until it does I see no point in putting them in storage.



■ **GEN KINNARD:** I think my answer would be along the closing words that Colonel Bristol just used. I'd like to see our inventory going to all the units that don't have aircraft now and desperately need them, and into the Reserves which are also extremely short modernizing the fleets of the Reserves and National Guard and that sort of thing.

Of course, I suppose your question starts after all of these steps have been done, but as of right now — and I'll get Colonel Powell to address this point — after all of that's been done, I'd guess that the moths wouldn't have very much to eat even if you didn't mothball them.

■ **COL. POWELL:** I agree entirely with what you've just said, General Kinnard. The problem is purely theoretical and as far as I can foresee, it will remain theoretical. We're not going to have that many.

■ **GEN. SENEFF:** If I could add just one note, sir, there are an awful lot of ground commanders coming back from Vietnam who have gotten used to the luxury of having choppers to work with or to support them in the field, and I am sufficiently optimistic to think that the number in the inventory is going to keep growing, rather than go down after the Vietnamese war.

■ **GEN. KINNARD:** They're not going to be able to keep them down on the farm after they've seen Paree — that's what they're saying . . .

■ **FLOOR QUESTION:** Speaking for an aircraft manufacturer, would you suggest the areas we could direct our R&D activities in support of CDC?

■ **GEN. KINNARD:** I tried to suggest some of the things in my closing remarks. The pitch that I am trying to make to the aviation industry, and for that matter to other industries as the CG of CDC, is the really great need that we have for you to get in on the fundamental conceptual planning that we're trying to do.

We're interested in seeing and listening to your salesmen — and we listen

to thousands of them with the expectation that we will get one percent return — but we do listen to them. But we're more interested in listening to your engineers and to your designers and your corporate long range planners. The reason for that, I think, is quite clear: that the expertise in technology and the ability to predict technical progress has left the Army *per se*, or at least it is preponderantly now in industry.

One of the toughest jobs that we have in Combat Developments Command is to try to get an honest appraisal — and I am not saying that "honest" vs. "dishonest," but "honest" vs. "We don't know what it is" — an honest appraisal of what is possible in technology "x" years from now and how many dollars (will it cost). So I guess my answer in the broad is to invite you to have your people — and most particularly your designers, as I say, and your long range planners — to come to CDC and tell us what kind of gleams you have in your eyes because we are trying to look not just at tomorrow, but we are trying to look all the way out to 1990. I think that is partially responsive anyway. If you want to pursue it, we'll go on from there . . .

I would like to add one thing. I am trying to set up a considerably expanded **Technical Liaison Office** in the Combats Developments Command that will be the point of contact, and that the ways that we can work together, I find, are almost without any limits because we're interested in the quick fix; we're interested in product improvement; we're interested in a better system of about five to ten years hence, but we are also interested starting from scratch to design a land combat system. I would like to turn it around and ask you the question: **What can CDC do to use industry better, and I mean that very sincerely?**

■ **NORMAN TAYLOR** (Boeing Vertol): As we understand the defense climate today, we must operate to the established system which means to get a

QUESTIONS AND ANSWERS

(Continued from Page 41)

new system in the inventory there is a formal system — a concept formulation contract definition and acquisition phase.

Our observation is that as of today in viewing the importance of Army aviation, we have to say that we see a dearth of RFP's (**Requests for Proposals**) to industry for relatively economical concept formulation study contracts. The advantage of going through the concept formulation contract route, rather than listening to salesmen or long range planners — a technique that has often been used in the past — is that by our working with you through the contract method the data is presented in such a way that your technical staff is then required to review the data in depth and to assess its creditability so that then the long range planners in the government are assessing government-approved technical data, as distinct from salesmen brochures.

So, in summary, we feel that there is a great deal you can do to help us work with you more effectively. We plead with you to increase your rate of RFP's for concept formulation study contracts covering a full gamut of the recommendations that you gave in the summary of your excellent talk this morning.

We would rather deal with you via the contract study route than come in and give you salesman presentations, because the data submitted to you via the contract study route has 100 times more creditability to your decision makers than the presentations that one might make on an informal basis.

■ **GEN. KINNARD:** Well, we are doing that. Are you saying that we need to do more of that?

■ **MR. TAYLOR:** Yes, sir. For example, I am not aware of the RFP's for the concept formulation for a **Chinook** replacement or a **Huey** replacement. They won't be available as I understand it, for several years.

■ **GEN. KINNARD:** I can't tell you how long it will be, but I can tell you that we are working in both of those areas.

■ **COL. BRISTOL:** Focusing on the end items of the future is, of course, one case in which you just have to wait for the passage of time until the Army makes up its mind that it's going to move out for a particular item.

However, coming out of the Vietnam operation is a tremendous amount of bits and pieces of information that I believe industry could be working on today. For instance, the environmental conditions of our crews and the troops we carry have, for the most part, been a "cut and paste" operation.

Ready for service is the only integrated weapons system that I know that the Army has developed to meet its requirements today — the AAFSS. Crew protection was designed into this aircraft from the beginning.

We know a lot about what is best armor (and armament) today and I assume that we will know more and more, but the thing that industry must do is to show us how we can actually integrate armor into the basic airframe so we never add it on or take it off. In other words it is a part of the aircraft when we build it, and it would be in this direction that I would encourage any industry effort, aside from what we fund in our own programs. If they devote their attention to this, when the time comes for contract definition on a particular end item we would, in fact, have a better base from which to move into the design of a combat-worthy machine.

■ **COL. BUCHAN:** Sir, I wonder if the panel sees a requirement to move a large number of Army aircraft at one time under instrument conditions, such as an airmobile operation in Europe, and if so, what are we doing about experimenting in this area and what is our progress at this time?

■ **GEN. KINNARD:** Well, I think that you individually know, although I'm not sure that everybody knows, that

quite a lot of work was done in this area under **Project Red Dog** by Colonel (Chester) Mead primarily in the 11th Air Assault Division, and the premise was that we definitely did need to be able to move in marginal weather. We questioned whether we could move in formation; we were quite sure we could move with individual aircraft.

The work on the **Red Dog** report was put out in the form of a field manual, which perhaps not all aviators know. I'm sorry I can't pull a number out of my head right now but there is such a field manual.

As I tried to suggest in my closing remarks, I think that we do have to continue to work on the weather problem, particularly with a view to solving the kind of weather that you have in Europe.

I think that the solution in Vietnam is partially working "around the weather" where you operate where you can and when you can, as you know so well, but that in Europe where you are going to get really low fog for hours and days over a widespread area that we just have to come up with some answers and I believe we can. I think that it is very important!

■ **COL. POWELL:** I would like to go back to the discussion we had a few minutes ago concerning what CDC could do and what industry could do for CDC and vice versa. Five or ten years ago, the requirement statement was generally developed because two or three persons who had some good sound, operational experience sat down around a table with a couple of engineering types — all of them military or Department of Army Civilians — and after about two weeks they turned out a document called a **QMR (Qualitative Military Requirement)**.

This **QMR** went up through the system very rapidly, and if they had good salesmen up at the Department of Army level, several months after that there was the probability of the initiation of a new development. These days are gone forever!

As the gentleman from Vertol pointed out, you now require a tremendous stack of studies, cost effectiveness analyses, trade-off analyses, conceptual analyses, and things of this nature. This now causes the development cycle — between the time that someone starts to recognize the need for a new item of equipment until the time that someone can start to actually develop it — to be measured in years.

Now if industry can come up with a way of turning out instant analyses, this is something that you could really do for us. We hear a tremendous amount about the advantages of computerization, i.e. with a computer you push a few buttons and a few seconds later you get a whole bunch of information out of it.

But the programming to set this computer up tends to take months, and although we have a great many studies that are going on — most of them under General Kinnard's Combat Developments Command — we don't get answers very fast and we need answers that are based on good firm assumptions, answers that have examined in detail all of the alternatives and all of the pros and cons of those alternatives and we need these answers rapidly, much more rapidly than we have been able to get them. If you gentlemen in industry can find a way to assist us through your capabilities you can do a great deal to foster the progress of the development of new concepts and of new materiel.

■ **GEN. KINNARD:** One of the things that I alluded to — the idea of studying by families — is at the root of this question, too. For example, as we try to look at the **UTAAS**, follow-on aircraft, we found that we could not look at it in isolation. We found that we had to look at the **LFAS** on one side and the **LOH** on the other, and really you can't look at the **LFAS** until you know what the heavy lift helicopter is. So, it gets to be quite a puzzle.

The sophistication of the studies that we really have to produce nowadays is

QUESTIONS AND ANSWERS

(Continued from Page 43)

quite a high order, and I really have been encouraged since I have been at CDC at the progress that is being made.

I think we're getting fairly good now at looking at parametric studies that include various types of aircraft of all sort of sizes and different speed ranges and so on, and coming up with a pretty good handle on it, and then having gone through this and comparing sets of mixes. As far as I know, nobody has been doing this in years past and it turns out to be pretty tough. I think that it is just going to take some learning how to cope with it for a few years.

■ **FLOOR QUESTION:** Sir, one thing we would like to see from industry's standpoint is a little better description of the future, if you could provide it. I know it is a pretty difficult question to ask, but generally the briefings of what the Army is thinking of take us right to almost the immediate forthcoming generation of equipment.

The Army, I know, looks a lot further ahead than that and sometimes industry sort of goes off in a tangent for they don't know whether the Army wants to go supersonic, or whether they want to slow down to the speed of the infantrymen.

We do know that descriptions of the future have all sorts of wonderful things where every airplane can operate under all-weather conditions — planes that are very simple to fly and very simple to operate, and we can see lots of dollar bills going into these things. That immediately puts a brake on this sort of thing because we know it isn't going to be possible financially.

We'd like a feeling of just how the aircraft are going to be integrated into the Army in not the next ten years but the ten years beyond that — at a point when we are talking about them really replacing ground vehicles wholesale — where instead of being thousands of aircraft, there would be tens of thousands

and maybe even more than that.

You have the studies, you make them regularly, I know. Industry just isn't privy to these things and I think that it would be of real assistance to us if we could see these things.

■ **GEN. KINNARD:** I agree with you on both counts. We are making studies. We're a little bit behind the power curve. For example, we put our 1980 study on ice in order to try to get out and get the 1985 study done and get a jump on the thing and when we came back to work on the 1980 study — Army 80 studies — we found that there wasn't that much difference (between them) so we're really spending our time trying to get on 1985.

Beyond that in the 1990 studies we're trying to look at land combat as a system. This is the hope, but this takes a lot of getting onto. Now your point about exposing this to industry is one in which I'm engaged in trying to do something about right now.

I think there is a great deal we can tell you about our conceptual studies and I think also that there is a great deal you in industry can do to help us make those studies meaningful because our crystal ball is at least as murky as yours.

■ **GEN. SENEFF:** Using a crystal ball is very difficult. Who in this room in 1960 would have forecasted what's going on now?

■ **UNIDENTIFIED VOICE:** I think that this has been a very interesting discussion, but what we are running into is that we, and we mean industry and the Services — in fact, the whole nation — seem to be getting far more interested in **how** we do something than in doing it and getting on with it. We have really been talking here about the problem of obsolescence.

I think that our technical capabilities are expanding more rapidly than we've ever seen, and at the same time the paper parade by which we procure items is getting longer and longer. This assures us that when we finally get the

aircraft they are going to be more obsolete when we deploy them than they have ever been in the past.

I think this has a bearing on General Howze's question — he asked whether we were going to mothball the aircraft. We have flying today some very, very fine aircraft, but I think that the mothballing may be academic because I think that they will be too obsolete to use in the future.

What we have really been talking about here is this alarming increase in the paper parade that stretches and slows down the entire technical development that we know is at hand.

■ **GEN. KINNARD:** Well, I don't like the paper parade any better than you do. How do we get rid of it?

■ **UNIDENTIFIED VOICE:** I think that's more on the Service side than on industry . . . (Laughter.)

■ **GEN. KINNARD:** I wouldn't say that we have a monopoly on it, but maybe we do have the edge . . . (Laughter.)

■ **COL. BRISTOL:** On the subject of the Army in relation to industry, I think many of you know that we hold many **Advanced Briefings for Industry** in AMC. Each commodity command is charged with doing one each year, and last June some of you had the opportunity to attend the one that AVCOM held in St. Louis. We plan our next one in May.

Now these are classified sessions at which secret information will be discussed and was last year. I would hope — and we will work with our sister commands — to try to do just what industry has asked in the **Briefings** meeting that we'll present next year. To the best of our ability we'll try to indicate where the Army is going.

I think the one we held in June, 1967, did point the way pretty much to some of the questions that have been asked here. How far down we would go in getting into the details of various quali-

tative requirements is dependent on time in each instance.

■ **GEN. KINNARD:** One of the ideas that we've considered at CDC is to try to have seminars whose theme would be the longer range studies in particular areas — vehicular studies, aircraft studies, and so on and to make the seminars a little bit different from my visualization of a standard seminar at which the military brief and brief and brief, and you're supposed to have a thirty minute question period at the end. Somebody goes overtime so you have five minutes and you get one canned question that they answer.

What I have in mind is a seminar in which there is a great deal more participation by the members of industry, and it would necessarily be a classified seminar, but I believe in the longer range time frame that we can parallel what Colonel Bristol has suggested.

■ **JULIUS BRAUN** (North American Aviation): Sir, can I voice one thing on classified seminars? The one in St. Louis back in June was a tremendous seminar and we all enjoyed it very heartily. We were told we could not take notes because it was classified, so we didn't and we're still sort of wondering. We'd like to get the transcripts of these things.

Industry has a lot of money. They send us to these meetings and they really pay through the nose sometimes to get us to these things, and if the Army doesn't have time or if the Army doesn't have the funds to quickly get out the results of these seminars it would be quite possible for industry to go to some outside contractor that has a cleared facility to make the minutes of the meetings, prepare them up, and get them out to the participants — say within two weeks after the meeting is over.

I think that you would get tremendous support from industry if you would do this and also take a load off your own briefing people who have to prepare these things. I'd just like to throw that out (for consideration).

**The '68 AVCOM-AAAA ABFI will be held in St. Louis during 6-8 May 1968.*

QUESTIONS AND ANSWERS

(Continued from Page 45)

■ **GEN. KINNARD:** I'd like to accept! ... (Laughter.) It's a good idea. Other questions?

■ **RUSSELL BANNOCK** (de Havilland Aircraft of Canada, Ltd.): General Kinnard, I would like to ask the question about future selection of aircraft, VTOL and STOL, with regard to the Army's experience in the past where in the first fifteen post-war years the Army purchased primarily off-the-shelf aircraft with FAA certification, helicopters and fixed wing aircraft that were primarily developed for the civil market but had a military fallout and these filled the gap.

Then you entered a period where you started to specialize in developing your own requirements, such as the **UH-1**, the **LOH** program, and so on. My question is: Is this the future trend of Army aviation requirements? Are you only going to buy when you develop to your own specifications and go through the tortuous procedures which we know that this requires.

My own personal view from observing the development of Army aviation over twenty years — and I address this as much to my industry colleagues as I do to the panel — that there is a tremendous world market for VTOL and STOL, particularly in the civil field, and perhaps if industry was encouraged a little more that there is a future military fallout if we develop aircraft to meet these various requirements and we have an opportunity of still meeting the Army military requirements, industry may put more of its own capital into R&D development.

■ **GEN. KINNARD:** The question, I believe, Russ, was whether the trend was in the direction of starting from scratch to develop as opposed to buying off-the-shelf. I don't think there is any question about that being the trend and you're asking whether it is going to con-

tinue. My offhand answer would be that the trend will be a function of the willingness of industry to make ventures on their own.

What you suggest is that somehow we can encourage them by telling them that V/STOL is here to stay. How do we do that?

■ **MR. BANNOCK:** Well, I would suggest that in your studies in CDC you perhaps collaborate a little more with the civil organizations such as ATA, HAA, the new Commuter Airline Association, etc.

These people are rapidly developing requirements of their own. The helicopter people and the commuter people are looking very hard at STOL requirements. There is a STOL committee in ATA. All are looking very hard at these requirements, and as I mentioned earlier my observations are that many of these requirements are very parallel to your Army aviation requirements.

I feel that in the past the Army got tremendous value for their dollars in equipping themselves with off-the-shelf vehicles, and if there is a little more encouragement given to the manufacturers that you may do some of this in the future the manufacturers may plunk a little more of their own dollars into R&D.

■ **COL. POWELL:** Russ, I would like to point out to you that in the last year the Army has bought off-the-shelf four different types of aircraft for a total quantity of something in excess of 800 aircraft. I speak of the **TH-55**, the **TH-13**, the **T-41**, and the **U-21**. The **T-42** is a little bit before last year.

I might also point out that we are presently running a competition for the procurement of the **LOH** against a fixed specification, and at the present time of this competition, this is not a military development program for the purposes of procurement. Further, if there were a private aircraft — a privately-financed aircraft — that met the specifications there is no bar to its entry into the competition.

■ **MR. BANNOCK:** That's most encouraging.

■ **COL. BRISTOL:** One-sixth of the aircraft purchased by the Army in the past few years has been off-the-shelf. Maybe we at AMC are somewhat at fault in that we do not participate with AIA. As a matter of fact we presently attend many meetings. We are meeting on reliability and all the aspects of engineering, management, etc. to the best of our ability. I think that maybe what is lacking here is we should invite a certain amount of CDC participation in some of these so that we can sample the thing to which Mr. Bannock refers, i.e., what industry is looking for, and what commercial applications exist that have some commonality with us (in the Army).

■ **COL. POWELL:** All of these aircraft that I mentioned, in addition to being bought off-the-shelf, were bought competitively against a specification which was drawn up jointly by CDC and AMC to perform a specific mission.

I believe that everyone of them was done through what we call a two-step competition. There may be an exception of which I can think at the moment, but by and large they were bought through the procedure in which interested firms are given the opportunity to make proposals of a technical nature on the capability of their entering a competition to meet that specification.

During step one a technical evaluation is performed and at the end of that various entrants are determined either to meet or to fail to meet the specification which is representative of the operational requirement. The second step then becomes a price competition.

I'd like to point out, also, that the principal reason why we go into military development is that a machine which will meet our capabilities does not exist in the civilian market.

The basic philosophy of the development of QMR's is that having developed an approved QMR, the first step thereafter is to explore what is immediately

AAAA

Professional Meetings

MARCH 5-7. Advanced Planning Briefings for Industry and an Aviation-Electronics Symposium at Fort Monmouth, N.J. Sponsored by the U.S. Army Electronics Command, the Armed Forces Communications and Electronics Ass'n (AFCEA), and the Monmouth Chapter of the Army Aviation Association (AAAA). In addition to the briefings on ECOM's R&D program, the 3-day conference will feature a symposium at which selected papers will be presented. Papers should be submitted between Jan. 15 and Feb. 20, and be classified no higher than CONFIDENTIAL. For information, write Special Assistant to the CG for Aviation and Aviation-Electronics, ECOM, Fort Monmouth, N.J. 07703.

MARCH 6-9. Ninth Annual Membership Meeting, USAREUR Region, AAAA, at Garmisch, Germany, Army presentations, March 7-8. Presentations by Allied officers, March 8. Industry presentations, March 9. Annual AAAA Regional Awards, March 9. For information, write COL John F. Sullivan, U.S. Army Aviation Maintenance Center, APO N.Y. 09028.

available that can be provided, and only after it has been determined that nothing is in existence to meet that requirement is an R&D program initiated.

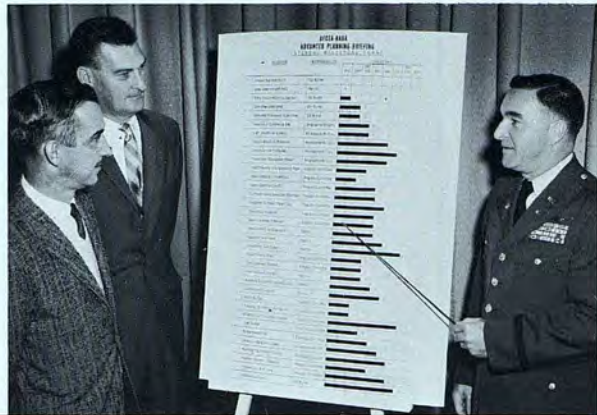
One of the main reasons why we have to initiate these R&D programs is that the machines that we want in certain categories are so terribly expensive that private industry can't afford to develop them on their own and they require government funds to accomplish this.

■ **GEN. KINNARD:** Speaking for the members of the panel, it has been our pleasure to make ourselves available for your darts and it has been thoroughly enjoyable. I liked it and ask for a return engagement next year. Thank you very much.

DEC.-JAN. PHOTOS



WASHINGTON, D.C. — David D. Thomas, Deputy Administrator of the Federal Aviation Administration, is shown receiving an AAAA "Certificate of Honorary Membership" in the Washington, D. C. Chapter. COL William B. Dyer, Chapter president (right), made the award at the Chapter's formal Christmas Dinner-Dance. Holder of a commercial pilot's certificate, Thomas is recognized as one of the outstanding world experts in the management of air traffic control.



FT. MONMOUTH — Planners review progress and target dates for the March 5-7 ECOM-AFCEA AAAA co-sponsored symposium on aviation-electronics and supporting sciences. Talking over plans for the advanced planning briefings for industry and symposium are COL James L. Burke (right) project officer; John F. X. Mannix and A. S. Hubschman, assistant project officers. Additional details on the conference are found on page 47.



FT. WOLTERS — As 1LT Albert C. Wilkins holds his H-23 at a hover, CWO Ronald M. Wells (in left litter) replaces the burned out warning light atop the local Thurber Monument. Riding the other litter as ballast is PFC Sonny Pittman. All are from the Facilities Branch as USAPHS. Dedicated to the coal and oil industry, the monument is located on the Carroll M. Bennett ranch in nearby Thurber, Texas.



CHON THAN — A chrome-plated, 7.62mm captured Russian-made machine gun, mounted on a wooden rack with engraved brass plaque, is the memento made by infantrymen of the 1st Bn, 18th Infantry. The award was presented to the personnel of the 213th Assault Support Helicopter Company of the 11th Combat Aviation Battalion for that unit's all-out support of 1st Battalion. Shown, left to right, are LTC George W. Adamson (213th Co), Sp4 Robert L. McDaniel (Gunner), Sp5 Joseph T. Badilla (Crewchief), Sp4 William R. Wheeler (Flight Engineer), and LTC Richard E. Cavazos (1st Bn Co), host at the field dinner for the visiting "Black Cats."

CHANGES OF ADDRESS

PCS

PCS - GENERALS

KNOWLES, Richard T., MG

SENEFF, George P., MG

COLONELS

JONES, Luther G., Jr.

MOORE, Howard M.

PEYER, Gustave A.

PUMPHREY, A.T.

THOMAS, William G.

THOMSON, Arlington C., Jr

LT COLONELS

ANDERSON, Paul F.

AVANT, Osa J.

BAL, Roscius I.

BEADLE, Donovan M.

BILLMAN, Ervin L.

BOGGS, Joseph C.

BOSAN, George S.

BROADY, William /

AV

BURTON, George T.

CAMPBELL, Bruce B.

PCS - LTCS

CANTLEBARY, Lee R.

CARTER, William C.

DAVIDSON, Kenneth E.

DeLOACH, Jimmy D.

EGGERS, John F.

FERRIS, Gordon F.

FLEMING, Charlie P.

FRANZNICK, John R.

GANT, Preston G.

GORDON, Marvin E.

HARK, William H.

HELTON, Pelham G.

JOHNSON, Clifford E.

KARK, John S.

KRACHT, Peter M.

LANEY, Ira L.

LEFEBVRE, Bernard R.

McCOY, Robert C.

McCRANIE, Asa C.

NUTTALL, Richard W.

PCS - LTCS

OPENSHAW, Robert G.

POOLE, Joseph H.

PRATER, Robert M.

FRIEM, Charles M.

ROGERS, Richard W.

SIMMONS, Jerry A.

SLAVICH, Ivan L., Jr.

SMITHEY, Paul C.

STACY, John F., Ret.

THOMPSON, Bernard D.

WALTS, Charles C.

WILLIAMS, Robert D.

ZENZ, Alexander R.

MAJORS

ABBEY, Charles W.

ADDY, B.W., Jr.

ANDREE, Robert G.

BARBOUR, Frank P.

BEAUMONT, Marion E.

BEITZ, Charles A., Jr.

PCS - MAJORS

BENTON, William B.

BERDUX, Sylvester C.

BISHOP, James

BOYLE, Willard F.

BRADLEY, William C.

BRIGHT, J.C.

BRIOT, William R.

BROOKER, Clarence B.

BROWN, Gary A.

BRYAN, Clyde M., Jr.

BURROUGHS, Donald R.

CACOLICE, John P.

CARNEY, Charles V.

CHRISTIE, Thomas C.

COLEY, Thomas W.

DAVID, Ronald C.

DEMM, Paul W.

DILLER, Richard W.

EGGLESTON, Carl B.

PCS - MAJORS

ESTORES, Sofronio J.
 EVANS, Dan H.
 EVANS, Wallace M.
 FLETCHER, James F.
 FRANK, Laurence A., Jr.
 FRAZELLE, Jack H.
 GALE, Paul B.
 GARRISON, Darrold D.
 GEER, William A., Jr.
 GILES, George R.
 GILLINGHAM, Richard I.
 GOCHNAUR, Thomas L.
 GOLDING, Willard E.
 GOODMAN, Dorris C.
 GORDON, John E.
 GREENE, Robert P.
 GRIMES, Charles W.
 GUILLOTTE, Robert L.
 HALL, Gary C.
 HALLMARK, Robert C.
 HALLY, John E., Jr.
 HART, James E., Jr.
 HENRY, Frank L.

PCS - MAJORS

HERBOLD, Robert A.
 HUDSON, Samuel R.
 HUGHES, Jimmie T.
 HUSKEY, James E.
 ISAAC, James E.
 JONES, Charles R.
 JONES, Melvin R.
 JOYCE, John J.
 KANNING, James R.
 KILPATRICK, Thomas M.
 KOLLHOFF, Ronald K.
 KREULEN, Ray H.
 LAGRANDEUR, Kenneth W.
 LAW, Sherrill G.
 LAYA, Robert E.
 LEEDHAM, D.W.
 LOVETT, John A.
 LUNDIN, Keith E.
 MALONEY, William H.
 MARDEN, Richard H.
 MARK, James C.
 MARSHALL, Thomas J.
 MASSENGILL, James R.
 McCONNELL, Lewis J.

PCS - MAJORS

McDONALD, Frank A.
 McINTYRE, Stephen, III
 McKINSTRY, Thomas I.
 McMURRAY, Thomas I.
 MERRITT, Ronald H.
 MICHEL, Robert W.
 MILLER, Billy G.
 MORGAN, George A.
 NEU, George T.
 NEWTON, Robert W.
 NICHOLSON, Rowland J.
 O'CONNOR, Thomas W.
 OKANE, Robert F.
 ORR, Gerald W.
 PORTER, Warren R.
 POWERS, Davies R.
 RACKLEY, Robert L.
 RICHARDSON, Charles E.
 ROACH, Dick E.
 ROBERTS, Benjamin D.
 ROBERTS, Donald A.
 ROWLAND, Jerry D.
 SANDERS, Burnett R., II
 SCHRUM, James R.

PCS - MAJORS

SENER, George J.
 SHIELDS, George D.
 SIBERT, George W.
 SLOAN, Charles W.
 SMITH, Courtney E., Jr.
 SMITH, Derald H.
 SMITH, Hubert G.
 SPENCE, William C.
 STEIN, Henry J., Jr.
 STERNAT, Robert F.
 STUART, Robert M.
 TERRY, Frederick G.
 TOBIASON, Allan R.
 TOLFA, Edward, Jr.
 TOUCHET, James C.
 VALLEY, Donald M.
 VAN WINKLE, Daniel G.
 WADE, William T.
 WAPPES, George R.
 WATSON, Dwane C.
 WATSON, Jessie W., Jr.
 WEBB, Ivan R., Jr.
 WILSON, Chester L.
 ZUMBRO, Harold D.

CAPTAINS

BAUER, Arthur S.

BAUGH, Robert M.

BAUMGARTEN, John R.

BLACK, Jerry L.

BROTHERS, Ernest W., Jr.

BRYANT, Carlie E., Jr.

BUDIG, Sherwood R.

CHAUVIN, Charles E.

CRAWFORD, David H.

CUMMINGS, Leonard W.

CURTIS, Danny D.

DALE, John W.

DALTON, Robert B.

DECK, Howard R.

DEW, Donald L.

DZINGLESKI, Norman J.

ECKLES, Melvin H., Jr.

FERO, Richard

FISCHER, Wayne S.

FOSSUM, Raymond O.

FREEMAN, Eldon V.

GOLDTRAP, John W.

HANKINS, Charles A.

HAWK, Clinton T., III

PCS - CAPTAINS

HEDRICK, John V.

HIGGINBOTHAM, James L.

JACOBSON, Charles H.

JONES, Stanton W.

KENNY, David L.

LEADABRAND, Jerry A.

LEE, Clarnece E., Jr.

LITTLE, George W.

LITTLEWOOD, Arthur R.

LONG, Donald E.

MALCHOW, Earl L.

MUGERDITCHIAN, Jerome

MURRAY, Thomas E.

OWEN, Dean M.

PAIGE, Vernon G.

PARKER, William R.

PETTA, David J.

PHELPS, Lloyd C.

PRATT, Donald E.

PRESTON, Edward J., Jr.

REEVES, Troy, Jr.

ROBINSON, James E.

ROSS, Frederick L.

SANDERS, Ernest W.

PCS - CAPTAINS

SCAMAHORN, William E.

SCOTT, James A., III

SIMPSON, Allan R.

SMITH, Elijah H., Jr.

STEPHENSON, Alan J.

STOFER, Gerald B.

TARR, Richard C.

TEMPTON, Willie A.

THOMPSON, William A.

WETZEL, David C.

WILDE, William A.

WILSON, Max H.

LIEUTENANTS

ADAMS, Barry H.

ADAMS, Richard D.

ANDERSON, Terry

PCS - LIEUTENANTS

BAASCH, Richard A.

CALDWELL, Harold M.

CANEVARO, Gerard F.

CANON, Charles M., III

CASTLE, Herman C.

CHANEY, Douglas D.

CLINE, Charles J.

COATNEY, Jeffrey R.

CODDINGTON, James M.

COOPER, Clarence C.

COREIL, Vincent D.

CURTIS, Donald O.

DOUGHARTY, Steven W.

DOWNS, Joseph N.

EHLERS, Robert O.

EVANS, John D., Jr.



BONN, GERMANY — Shown at the first dinner meeting of the Bonn Area Chapter of AAAA on Dec. 8 are, l-r, GEN Hamilton H. Howze, USA (Ret.), AAAA national president; COL Alexander J. Rankin, Ret., Chapter president; and MG Helmuth Maeder, Truppenamt. The 65 attendees included senior officers from the Federal Ministry of Defense, and representatives of 10 U.S. and German aviation firms.

PCS - LIEUTENANTS

PCS - LIEUTENANTS

PCS - LIEUTENANTS

PCS - CWOS

FORD, Randall W.

FORSTER, Karl M.

FRY, Jerry R.

GARDNER, Terry P.

GILLMAN, Jay E.

GREGERSEN, Mahlon C.

HAKES, David H.

HILL, Richard C.

HOERLE, Arno J.

HOFFMAN, Richard W.

HOZA, Philip J.

HUGHINS, David A.

HUSTON, David

JONES, Harry E., Jr.

JURNEY, Lee W.

LITTLETON, Gerald W.

LOTT, William M.

MALDONADO, Frank R.

MALOWNEY, John R.

MARTIN, John S.

MARTY, Wayne D.

McADAMS, Charles O.

MEACHAM, William C.

MORGAN, Claud E., Jr.

NILIUS, Robert M.

PADGETT, David E.

PLUNKETT, Gerald W.

POOLE, Otha L.

PRATT, Ernest B.

REAVIS, Lonnie C.

REESE, George G., Jr.

RICHARD, Newton M., III

RITZENTHALER, Jos. P.

SAWYER, Eric S.

SCHWENT, William J.

SHANK, Wendell R.

STEPHEN, Michael J.

STIVER, Donald L.

THOMPSON, Larry M.

VOEGTLY, Victor S.

WILCOX, Robert W.

WILLIAMSON, Donald R.

CW2 - CW4

ALLISON, Ralph L.

BADIA, Albert F.

BEVERIDGE, Robert A.

BEDLINGMAIER, J.F., Jr

CROSS, Thearon M.

CROUCH, Jacob C.

DERFUSS, Gerald G.

DICKEY, Kenneth E.

DONLEY, Kenneth G.

ENGLISH, Wendell D.

FENTRESS, Donald R.

FERGUSON, Edward O., Sr

FERGUSON, Richard L.

FOSTER, Marshall P.

GODFREY, James A., Jr.

HAMPTON, Valentine

HARDIN, Philip D.

HIERHOLZER, Anthony G.

HOLCOMBE, Albert M.

HONDA, Gilbert S., Jr.

KEEHN, Richard C.

McGARRY, Charles M.

McNAIR, Charles T.

MOODT, John C.

PATTON, Donald F.

PETERSEN, Dwayne L.

PRICE, Frank H.

ROPER, Loy D.

ROVETTO, John L.

SAYLOR, David R.

SHAW, Paul L.

SHORTRIDGE, Richard B.

SNYDER, Robert F.

SULLIVAN, Bernard P., Jr

THURMOND, Wymond N.

TRUCHON, Michael

WARD, Clark H.



CORPUS CHRISTI — COL Floyd H. Buch, retiring ARADMAC commander (left); COL Luther G. Jones, Jr., recent 34th General Support Group commander in Vietnam and new ARADMAC commander; and MG John Norton, CG of USAAVCOM, St. Louis, Mo., are shown following the award of the Legion of Merit to COL Buch at change of command and retirement ceremonies held December 29.

PCS - CWOS

WILKERSON, Ronald U.

YOUNG, Edward G.

WOS

ALBERS, Michael W.

ALEXANDER, Wayne R.

ALLRED, Garry D.

ANDERSON, Howard D.

ARANN, Richard M.

ASHCRAFT, Ralph G.

ASKINS, Alfred L.

BABYAK, Lawrence J.

BALDWIN, William R.

BARTLETT, Angus H.

BEDARD, Dennis B.

BELLAK, J. Peter

BELSKY, Francis T.

BENOIT, Gregory A.

BLAIS, Kenneth D.

BLOHM, Ronald R.

BOND, Charles W.

BOYNTON, Frank M.

BRACKEN, Evan A.

BREUCHE, Frederick W.

BURRIS, Donald D., Jr.

PCS - WOS

CALDWELL, Harold E.

CERULLO, Albert C.

CLARK, Harold P., II

COLEMAN, Michael M.

COLLIER, Elmer

COOMER, Howard D.

COONEY, James T.

COX, Douglas D.

CRAM, Danny L.

DAVIS, Morris M.

DAVIS, Perry J.

DEAL, Berman R.

DIKE, Francis C.

DOONAN, Robert

DOYLE, Barry A.

DRABEK, Anthony S.

DUBBS, Edward A.

EARLE, Richard N.

EMERSON, Dale S.

ERDKAMP, Lawrence T.

EZELL, Vernon P.

FISHER, James M.

FRANKLIN, Steve D.

FREDERIC, William J.

PCS - WOS

FREEMAN, Roger D.

FRENCH, Wallace Carl

FULLERTON, John N.

FUNK, Frederick G.

GALLAGHER, Kent O.

GAMBLE, Steven F.

GARCIA, Vincente S.

GARRISON, John A.

GIBBS, James R.

GILMORE, Richard B.

GOULD, Phillip F.

GRAHAM, Gregory G.

GREEN, Jerry L.

GRIFFITH, Dorlin W.

GRIFFITH, James W. Jr.

HAMMON, David B.

HAMMONS, John M.

HARRIS, Robert R.

HATCHER, Daniel P.

HENSON, Gordon G.

HEWTON, Jack A.

HOLLY, Robert F.

HULL, Ricky L.

HUNT, William A.

PCS - WOS

HUTCHISON, James R.

JOHNSON, Dale L.

JOHNSON, Richard E.

JONES, Roger D.

JURCZENIA, Thomas M.

KELLENBENZ, Ronald L.

KLESEN, Joseph L.

KOCUR, John M.

KOEPEKE, James A.

KOSKO, Charles J.

KRASNOR, Alan R.

KUPOVITS, Terry M.

KUSTERMANN, Robert J.

LACKEY, Gary W.

LARSON, Paul N.

LAYSON, Carlos W.

LEARY, Patrick R.

LEONARD, William C.

LEPENSKE, James A. Jr.

LUCKING, James R.

MACALUSO, Michael J.

MACLEAN, Douglas E.

MAGROSKY, John J. Jr.

ARMY AVIATION

EDITORIAL AND BUSINESS OFFICES: 1 CRESTWOOD ROAD, WESTPORT, CONN. 06880

675

POSTMASTER: If this magazine is addressed to a member of the United States Military Service, whose address has been changed by official orders, it should be forwarded — except to overseas APO's — without additional postage. See section 157.4 of the postal manual.



Meet the most powerful CH-47 yet: The "C".

(32% more get-up-and-go with the same size power pack.)

The new Boeing CH-47C has the latest version of our T55 turbine.

Same size as before. Only 50 pounds heavier. But a lot more punch.

900 shaft-horse-power more, to be precise.

We did it by going from a three to a four stage turbine section.

Result? 3750 shaft horsepower. And a power/weight ratio of 5.87 — one of the best in its class.

So when the latest Chinook shows up in the Army's ranks with 25 percent more payload, you'll know two good reasons why.

Two of our latest T55's.



LYCOMING DIVISION
STRATFORD, CONN.