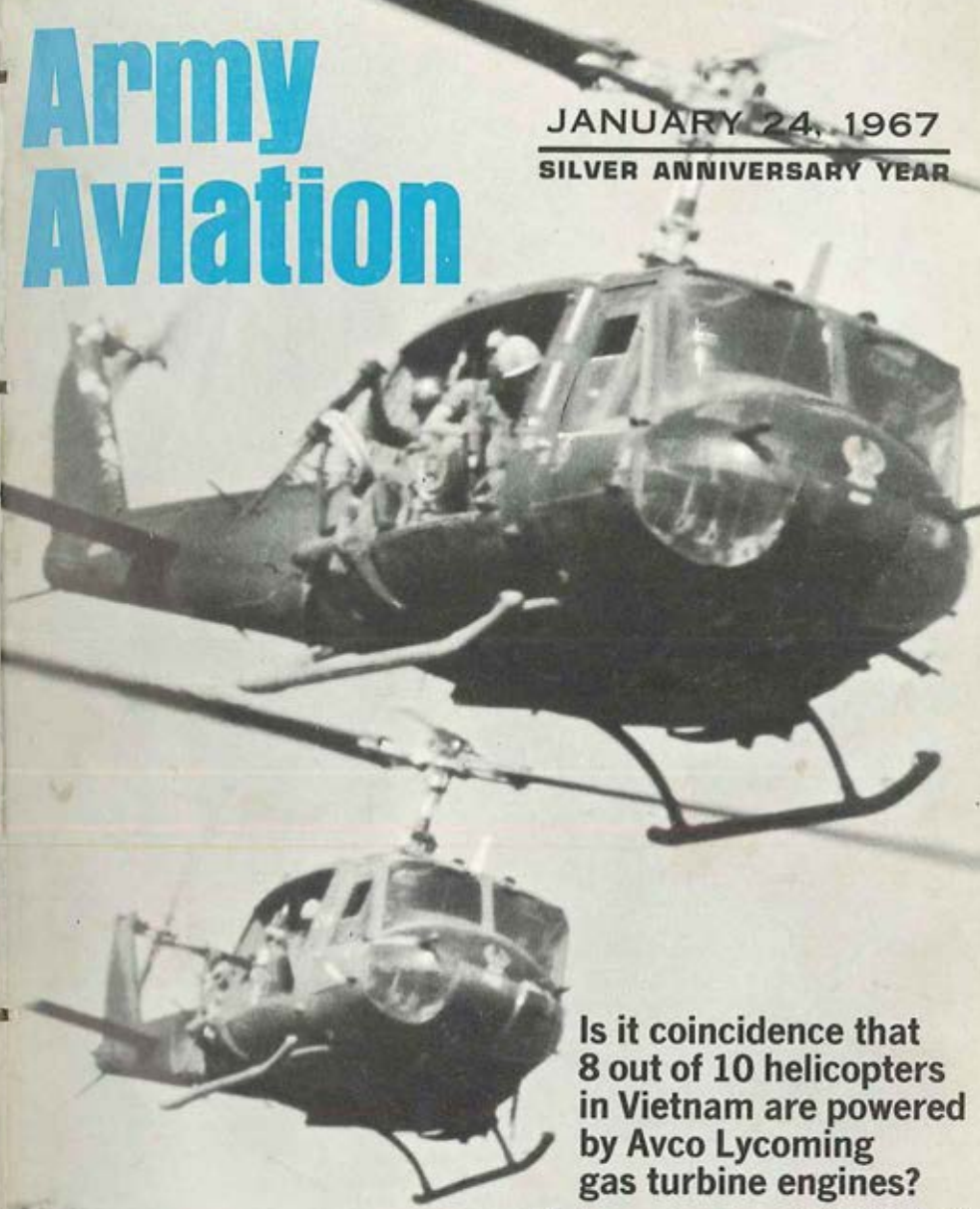
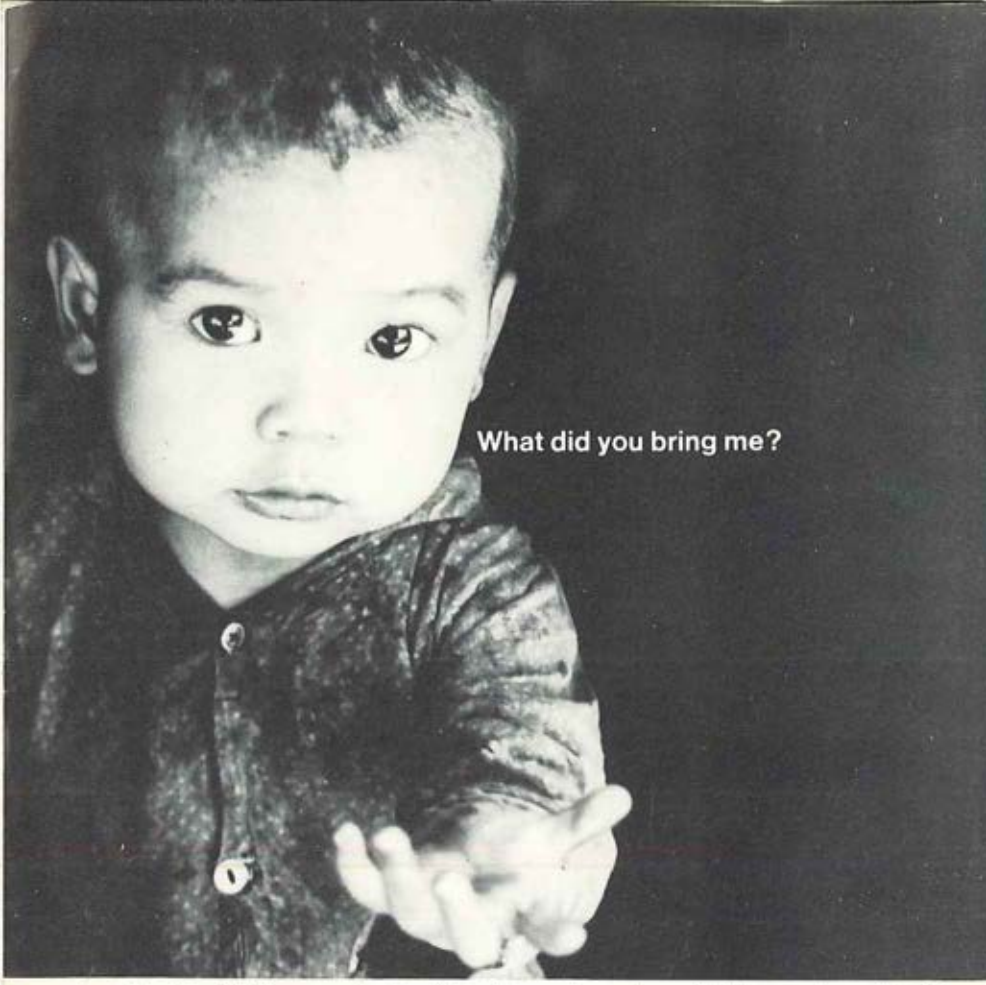
Army Aviation

JANUARY 24, 1967
SILVER ANNIVERSARY YEAR





Even the tiniest Vietnamese is old enough to sense that something terrible is going on where he lives.

But he's still too young to understand why or how or what war really is.

All this little boy knows and cares about is that a friend from the sky has just dropped in to see him.

And it's the same everytime a Boeing helicopter lands: first the mad dash for the aircraft and then a plaintive, "Ok say lem" (What did you bring me?).

This time, it's supplies and food for his village. And an extra candy bar for him.

It's also a time of new discovery for our friend. For like all children, this one's curious.

He wants to see and touch and examine everything. The rear ramp, the fuselage, the antenna, the things on top that make the big bird go up and down, the wondrous array of buttons, switches and dials in the pilot's compartment.

This is the other side of the war in Vietnam. Not a war of bullets and mortars and bombs. But of warm words, warm food and hope.

It's being waged everyday by Boeing helicopters.

The Boeing Company, Vertol Division, Morton, Pennsylvania 19070.

BOEING
Helicopters

ARMY AVIATION

DEC.-JAN. PHOTOS

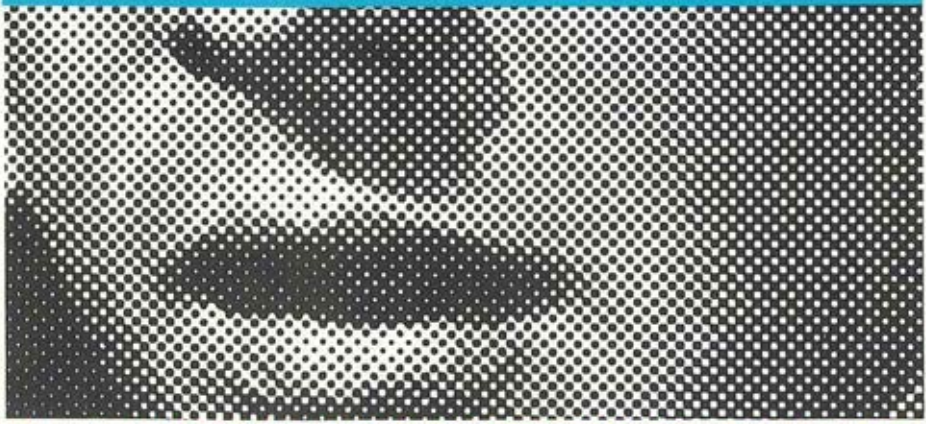
TAN SON NHUT — COL Daniel G. Traver is shown receiving the U.S. Army's highest award for meritorious service, the Legion of Merit, for his outstanding achievements as chief of the Aircraft Maintenance Branch, G4 Division, USARV, from Dec., '65. Presenting the award is BG Frank D. Miller, DCS for plans and Operations, USARV. (USA photo)

FT. MONMOUTH — Accepting the credentials of national and chapter Honorary Membership in AAAA, Dr. Russell D. O'Neal (right), Assistant Secretary of the Army (R&D), is welcomed aboard by COL Leslie G. Callahan, Jr., as BG Richard H. Free, Dep Dir of R&D at Hqs, AMC, looks on. MG W. B. Latta, CG of ECOM, also became an Honorary Member of AAAA the same evening. BG Robert R. Williams, Director of Army Aviation, was guest speaker at the Dec. 1 quarterly meeting.

FT. SILL — MG Harry H. Critz (left), CG of Ft. Sill, receives the certificate and insignia denoting National Honorary Membership in AAAA during ceremonies held at the Ft. Sill Chapter's Annual AAAA Christmas Ball. BG O. Glenn Goodhand, AAAA national president and guest speaker at the Dec. 2 formal, is shown presenting the membership before the gathering of more than 240 Army Aviators and their wives. GEN Goodhand, who was introduced by COL F. C. Goodwin, Chapter president, cited GEN Critz's outstanding interest in and many contributions to Army aviation.

FT. WOLTERS (Delayed) — GEN. Creighton W. Abrams, Jr., (right), Vice Chief of Staff, U.S. Army, is shown taking a close look at the cockpit and control of the Army AH-1G HueyCobra, manufactured by Bell Helicopter Company, during his mid-November visit to the U.S. Army Primary Helicopter Center. Bell test pilot, L. O. Rohebough, explains the controls. COL E. Pearce Fleming, Jr., Commander of the USAPHC, is shown at the left. The new high-speed gunships are expected to be operational by summer, 1967.

SPEAKING OUT



LET'S EMPLOY THE M-22 WIRE-GUIDED WEAPONS!

CURRENTLY available to our aviation battalions within Vietnam is a weapons system which I feel has been greatly neglected. This is the M-22 wireguided weapons subsystem. At this writing, the only unit in Vietnam equipped with this system is the 2d Battalion, 20th Artillery (Aerial Artillery) of the 1st Cavalry Division (Airmobile). The separate battalions within Vietnam do not have a weapons system to effectively match the capabilities of the M-22 weapons subsystem, and frankly, I think they should.

Let's take a look at a proposed organization that includes the M-22, and see how this system would greatly enhance the mission capability of the separate battalion.

Within each battalion a section of M-22's should be attached, numbering from two to six helicopters. For each two M-22's assigned, there should also be assigned one OH-6. The above figures could be juggled in any way to meet the mission requirements of the battalion. In addition, each of the M-22's should be mounted on the UH-1B/540 and include installation of the XM-58 gyrostabilized sight. The reasons for this will be explained later.

All three warheads currently available for this system should be procured and made available to the section. The first would be the 140mm shape charge, the most commonly used. This is primarily an antitank missile, but is very effective against bunkers, caves, and fortifications.

The second warhead is the 140mm HE, which has an effective bursting diameter of 30 meters and is employed primarily as an anti-personnel weapon.

The third warhead that should be made available to the section is the 140mm antipersonnel chemical warhead containing tear gas. This last warhead is probably the least known. Yet, there is considerable experimen-

By
CAPTAIN WILLARD E. BAILEY
Dept. of Tactics, USAAVNS

tation taking place on other means of delivering gas from helicopters. Here is a gas delivery means already developed, capable of a direct fire capability, and easily able to penetrate the jungle canopy such as encountered in Vietnam.

Multiple roles

Using these warheads, the section would be able to support the battalion in a multitude of operations, including, but not limited to, some of the following:

Placed in a general support role during the conduct of an airmobile operation, the section would have the capability of delivering LZ prestrike fires in a direct fire role. Two M-22's with six HE missiles each, could cover a front of 360 meters. The section would give the airmobile commander an on-call capability against anti-aircraft weapons with a standoff range of 3500 meters. Using the XM-58 sight with its six-power magnification, and working in conjunction with the OH-6, the M-22 should be able to locate the target in excess of 3500 meters and engage the target at 3500 meters.

The M-22 section could be used effectively in a convoy escort role. Again, using the XM-58 sight in an acquisition role, and working with the OH-6's, the M-22 could carry a mixed ordnance load capable of engaging any ambush attempt. As an example, the M-22 could deliver a gas warhead into a suspected area which would probably determine whether any enemy forces were located there. The use of the shape charge would give the M-22 the capability of engaging any of the enemy strong points or fortifications. The section could also be used to effectively intercept and destroy enemy sampans.

Day and night basis

The reason the UH-1B/540 was recommended is to give the M-22 the range necessary to conduct this mission. Besides being employed in the canal areas of Vietnam, the section could also support Coast Guard units patrolling off shore. As an example, the armed helicopters currently performing this mission do not have the acquisition means, destruction or standoff capability that is available with the M-22. Used in conjunction with illumination, i.e., the *Lightning Bug* or other suitable means of illuminating the target, this mission could be accomplished on both a day and night basis.

CAPTAIN Gary Watson (right), accompanied by Squadron Leader Bill Kilsby, Royal Australian Air Force, depart on a visual recon mission in an OV-1 of the 1st Aviation Brigade's 73rd Avn Company. The Mohawk unit has exchanged information with local RAAF units in familiarizing the Aussies with the Mohawk's reconnaissance capabilities.

Mixed ordnance loads

The preceding are but a few of the mission capabilities that could result by the attachment of this type section to the aviation battalion. The actual tactical employment, of course, would rest on mission requirements, but by using the M-22 equipped helicopters, the battalion would gain an effective means of extending its own acquisition and fire support roles. In effect, the battalion would have a weapons system which not only has its own acquisition means, but also a direct fire weapons system capable of carrying a mixed load of ordnance to perform its mission.

The actual training and assignment of personnel necessary to accomplish this mission could be done easily and in a minimum of time, because the means are available now.

By the adoption of this proposal, I feel that a section such as this could greatly increase the effectiveness of the aviation battalions in engaging and destroying the enemy forces currently being encountered in Vietnam.

BEECH "IMAGINUITY" IN MANNED AIRCRAFT...
This pressurized TURBOPROP member of the Beechcraft U-8 family of mission support aircraft offers high performance at low cost. High altitude over-the-weather capability means on-time operations in support of vital Vietnam assignments.

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No delays in delivery. In steady daily production now, the pressurized Beechcraft TURBOPROP U-8 offers a combination of features that match the broad range of growing mission support requirements:

1. Specifically designed to fit the mission profile of 80% of today's mission support trips. (1000 miles or less with 5 or 6 passengers.)

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mission support needs! Here's why:

10. Saves its cost over and over again when used instead of a larger aircraft.

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12. Worldwide Beechcraft service organization assures you of parts and expert service—eliminates need for expensive logistic support program.

Write now for complete facts on the Beechcraft TURBO-PROP U-8, or the other two "off-the-shelf" Beechcraft U-8s. Address Beech Aerospace Division, Beech Aircraft Corporation, Wichita, Kansas 67201, U. S. A.

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ARMY AVIATION

JANUARY 24, 1967

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AA in Photos

FORT MEADE — At 21, CW2 James E. Martin is one of the youngest men in the Army to complete the Instrument Examiners Course at USAAVNS. Shown at the controls of a First U.S. Army Flight Detachment U-8, Martin reported to Fort Meade following a 1965 combat tour in Vietnam (13 Air Medals). He's applied for a Regular Army commission and plans to make Army Aviation his career. (USA photos)

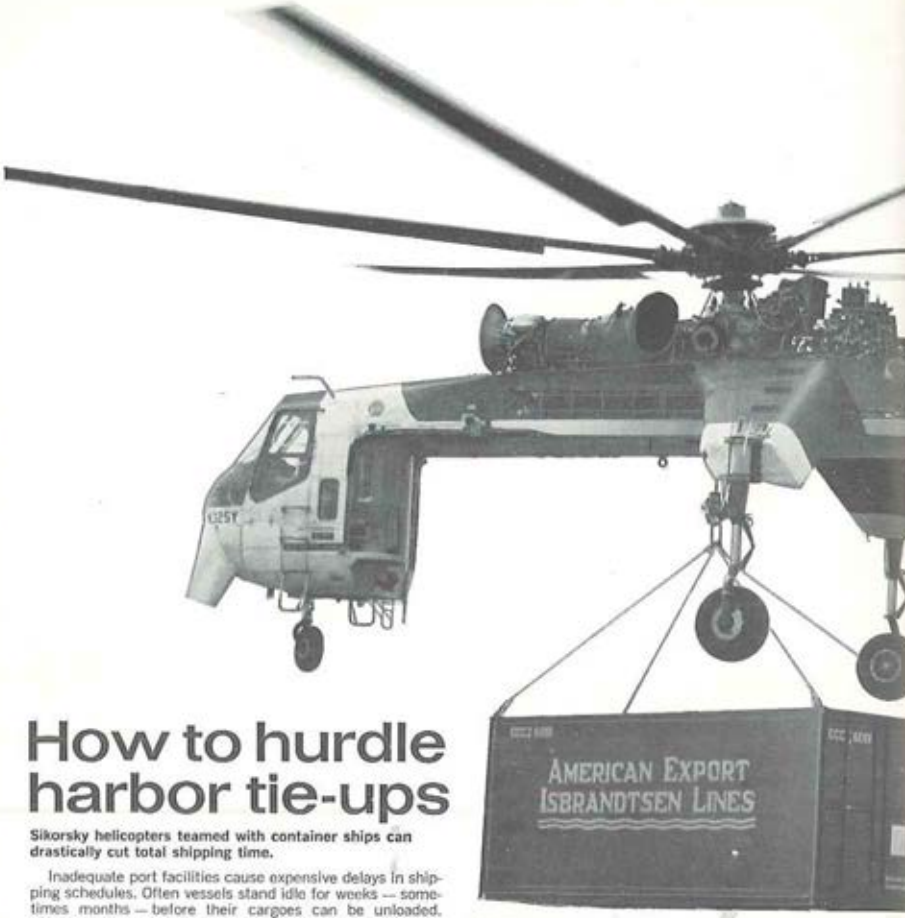
FORT BENNING — MG Robert H. York (left), CG of the Infantry Center, and COL J. Elmore Swenson, CO of the 10th Aviation Group, flank Congressman Jack Brinkley of Georgia on his visit to Group Headquarters. An ex-Air Force pilot, Brinkley was shown the latest techniques in training Airmobile Companies, and displayed high interest in current Army aviation equipment and procedures.

FORT WORTH — LTC Milton D. Dalpino (left), Chief, Bell Plant Division, is shown signing the acceptance of the first UH-1D to be delivered to the Army with a Lycoming L-13 engine. MAJ James L. Mitchell, Jr., Chief of the Flight Test Branch, observes the turnover of the form to Chick LaJudice, General Foreman of Airport Operations at Bell Helicopter's Ft. Worth plant. Initial quantities of the higher powered Delta's are to be delivered to Vietnam in early spring.

FT. MONROE — BG Frank Meszar (right, below), Asst Deputy Chief of Staff for Individual Training at USCONARC, has been designated to command the combined facility at Ft. Stewart and Hunter Army Airfield, Ga. He'll also serve as Deputy Commandant of USAAVNS.

FORT RUCKER — MG John J. Tolson, (right), CG of the Aviation Center and USAAVNS Commandant, has received orders assigning him to USARV on or about Mar. 1.

WASHINGTON — MG Delk M. Oden, a former Director of Army Aviation, D/A, will assume command of the U.S. Army Aviation Center at Ft. Rucker in March.



How to hurdle harbor tie-ups

Sikorsky helicopters teamed with container ships can drastically cut total shipping time.

Inadequate port facilities cause expensive delays in shipping schedules. Often vessels stand idle for weeks — sometimes months — before their cargoes can be unloaded. Sikorsky and American Export Isbrandtsen Lines have proposed a plan to solve this problem.

Sikorsky Skycrane helicopters would shuttle cargoes from container ships at anchor directly to the desired destination or distribution point. Containerized loads of up to 10 tons could be airlifted.

Now under study by the military, the new method promises substantial time and cost savings, and offers the solution for uncorking shipping bottlenecks anywhere — in Vietnam, for example.

The helicopter has given mobility and flexibility to our armed forces on the battlefield. The Skycrane can provide the same mobility and flexibility to the logistics of sea-borne supply.

Sikorsky Aircraft DIVISION OF UNITED AIRCRAFT CORPORATION
STRATFORD, CONNECTICUT


RSKY S-64

A RETURN TO NORMALCY!

by Brig. Gen. Robert R. Williams
DIRECTOR OF ARMY AVIATION, OACSFOR

New Year Greetings and Good News! Army Aviators will be pleased to learn that our aviator training program is moving onward and upward.

The Secretary of Defense has approved the Army's request to continue to increase aviator training output. As you know, we are currently building our active Army initial entry training capability to an output rate of 410 per month. This goal will be achieved by April 1967.

DOD has approved a further increase of 200 rotary wing aviators per month. Our new goal of 610 per month (7,320 active Army Aviators per year) will be approached as rapidly as facilities can be developed to handle the load. It is anticipated that the full 610 output rate will be attained in 1968.

As an additional point of interest, the Army's aviator population is expected to expand from about 10,500 now to a goal of approximately 23,000. It is anticipated that the ratio of commissioned to warrant officer aviators will become one-to-one during 1968.

In recognition of the Army's need for more flight training **"elbow room,"** and for school and support facilities, DOD has authorized expansion of the primary helicopter school at Fort Wolters, Texas, and activation of a new advanced helicopter training base at Hunter Air Force Base. Together with Fort Stewart, Georgia, Hunter Air Force Base will provide the necessary training area and facilities that will permit an orderly and rapid expansion to meet our new output goal.

Army Aviators can expect to reap the benefits resulting from this increasing supply of flying soldiers, eager to try their wings and carry forward the splendid tradition of excellence established by Army Aviators everywhere. While we are not out of the woods yet, as the supply of new aviators swells our ranks, normalcy should return with an attendant decrease in the personnel turbulence our aviators have experienced

in recent months. Career development assignments, to include higher schooling, technical training and ground duty tours, will be restored as soon as possible.

Furthermore, greater availability of aviators will permit the resumption of longer accompanied duty tours, less frequent moves, and family separations, which is a pleasant prospect for all, I am sure. Meanwhile, please accept my heartiest congratulations to all for a job **WELL DONE!**

Army Aviator Personnel Management Study

A Major study of the **Army Aviator Personnel Management Program** directed by the Chief of Staff, U.S. Army, has just been completed. The study group, composed of nine aviators and two non-aviators, remained in session from June, 1966 until mid-November, 1966. The group was chaired by Colonel George Beatty and functioned under the supervision of Major General Delk Oden.

They examined the present **Army Aviator Personnel Management Program** to determine what, if any, modification is necessary to insure that it provides:

- Army Aviator assets in proper numbers, grades, and skills, and maintains them in balance with requirements.
- Screening for elimination of commissioned aviators from the aviation program on an equitable, competitive basis to preclude the generation of excesses by grade.
- Recruitment of high quality potential aviators in proper numbers.
- Adequate career opportunity and career development for Army Aviators.
- Commissioned aviators with qualifications for senior command and staff assignments.

The study, dated 31 October 1966, includes conclusions and recommendations concerning aviation grade structure, excesses of commissioned aviators by grade, screening and retraining of excesses, recruitment, flight pay classification, and alternate career programs for commissioned aviators.

Some of the recommendations of the detailed and comprehensive 260-page study which were approved by the Chief of Staff were:

1. Establishment of personnel ceilings for field grade officers in the aviation program based on percentages derived from the Officer Grade Limitation Act. This means an increase in the number of field grade aviators authorized for assignment throughout the Army structure. Aviators will be assigned to branch immaterial spaces as are other officers of the various branches. This will permit greater flexibility by commanders in the utilization of their aviators and will help to insure proper consideration of Army aviation in all plans and operations.

2. Establishment of an additional system for screening commissioned aviators to preclude the generation of excesses by grade. The new system differs from those in AR 600-106 and AR 600-107 in that it provides for screening at the time selected for the next higher grade if the numbers to be promoted will create an excess. This process would preclude the generation of excess aviators by grade, would be equitable and competitive, would reduce personnel turbulence, and would time the screening so as to soften the morale and financial impact on the individual. Because of our rapidly expanding aviation program the implementation of this system will be delayed until firmer by-grade aviator requirements can be established. The majority of the screening will be accomplished at the time of promotion from Captain to Major.

A RETURN TO NORMALCY

(Continued from Page 13)

3. A proposed change in the classification of "flight pay." Flight pay is presently classified as hazardous duty pay. Despite improvements in aviation, flying continues to produce a higher fatality rate than any of the other military occupations classified as hazardous duty. Another reason for flight pay is becoming increasingly important. The skills an aviator must possess **and maintain** are in such demand by civil aviation, as well as the military services, that the Army must pay this premium in order to attract people to the program and, once trained, to retain these vital skills. The proposed new classification for flight pay will reflect both hazard and skill as reasons the pay is required. In this connection, the Chief of Staff **reaffirmed** the policy of maintaining aviation proficiency while aviators are assigned to non-aviation duties.

4. Continuance of the present career program for commissioned aviators as prescribed by AR 600-105. All commissioned aviators will continue to be offered full opportunity for career development through non-aviation branch material and branch immaterial assignments. The present program, even though disrupted by the strain of Vietnam, is still considered to be the best system for producing the type officer needed in the Army Aviation Program.

The Meritorious Unit Commendation was presented to the 765th Transportation Battalion (AM&S) in battalion ceremonies held at Vung Tau Airfield, Republic of Vietnam. COL E. L. Burchell, CO of the 34th General Support Group (AM&S) is shown presenting the award in behalf of the units attached and assigned to the 765th during 10 Oct. 1964 to 16 Dec. 1965. LTC Garrison J. Boyle, III, 765th CO, accepted the award at the 800-man formation.

5. Retention of the present system of administrative management of commissioned aviators within the branches authorized aviators. Along with the current career program many management alternatives, such as establishing an aviation branch or handling all officer aviator personnel records and actions in one office as is now done with full colonels, were considered. The present system is deemed to provide the best management organization for the successful accomplishment of Army objectives.

The Chief of Staff reaffirmed his intent that those commissioned aviators currently prevented from attending branch advanced courses or being assigned to branch material non-aviation duties will receive full consideration for promotions and will be afforded branch schooling and training at the earliest possible time.

Reduction In Aircraft Accidents

During the past three fiscal years, we have shown an encouraging trend in aircraft accidents. We flew 4,895 aircraft for 1,542,170 hours during FY 1964, and had a total of 371 accidents. Our accident rate that year was 24.1 per 100,000 flying hours.

In FY 1965, we flew 5,462 aircraft for 1,600,488 hours and had 351 accidents, for a rate of 21.9.

FY 1966 showed a further reduction. We flew 5,162 aircraft for 1,531,837

MEMORABLE BATTLE

GEN W. C. Westmoreland, CG, USARV, pins the Distinguished Unit streamer on the colors of the 145th Combat Aviation Battalion for the unit's heroic accomplishments during the battle of Dong Xoai in June, 1965. Assisting is SGM Maurice B. McBride (left) and COL Raymond P. Campbell of the 12th Combat Aviation Group. The ceremony took place at Long Binh on December 11. (USA photo)

hours and had 235 accidents, for an accident rate of 15.3. These statistics do not include our Vietnam experience, because of the operating conditions in that area.

While our accident record during these three years has shown a great improvement and indicates that we are all doing a better job, I am disturbed about some of the items that were brought to light during recent airfield surveys conducted by the U.S. Army Board for Aviation Accident Research. Among these are:

Aviators flying over swampy and mountainous terrain **without** individual survival kits and pen flare guns. The PSK 2 individual survival kit, FSN 6545-611-0978, is available and should be requisitioned for all aviators. The recommended pen flare gun, FSN 1370-921-6172, is only available at this time for issue to troops in Vietnam. However, they can be obtained through local purchase and I strongly recommend they

A RETURN TO NORMALCY

(Continued from Page 15)

be obtained and issued to aviators flying over hazardous terrain.

No established system for checking quality control of aircraft maintenance.

Failure to maintain time change and MWO compliance charts.

Improper and incomplete entries on DA Form 2408-13.

Failure to use aircraft operator checklists. In one case, the airfield commander was unaware of the availability of these checklists.

Torque wrenches in the 5-150 inch pounds range were **not** available to maintenance personnel. Torque wrenches on hand were not calibrated in accordance with TB 750-931-10/1.

The basic minimum safety briefing required for passengers on all flights was **not** being given.

While our accidents and accident rates have decreased, these items indicate we have not yet attained the degree of professionalism required for an optimum aviation safety program. Unsafe conditions can be eliminated and controlled through effective and continuous use of aircraft accident prevention surveys. The items listed above are included in the survey guide prepared by USABAAR. If you are not currently using this survey, I strongly urge that you obtain it and include continuing surveys in your SOP. Copies are available from: Director, USABAAR, Fort Rucker, Alabama 36360.

U-21 Aircraft Buy

The Army now has under procurement **U-21A** type aircraft. The **U-21A** is powered by two PT 6A-20 free shaft turbine engines and will have full feathering and reversing propellers. The following are guaranteed performance characteristics:

Cruising speed ..... 150 Knots
Maximum endurance ..... 5½ Hours
Single engine rate of climb .... 350 fpm
Service ceiling,
two engines ..... 20,000 feet
Service ceiling,
one engine .....10,000 feet

Seating arrangement will be of two types: Six passengers plus a crew of two in normal seats, or in 10 passengers, plus the crew, in troop seats. The aircraft was selected by two-step competitive procurement with **Aero Commander, De Havilland** and **Beech Aircraft** entering. **Beech** won the competition.

To clear the air a bit I would like to establish several points concerning these aircraft. The **U-21A's** are not administrative mission support aircraft; they are aircraft being procured to provide support for **tactical** units.

The Army U-8 series aircraft were procured for administrative mission support (more frequently referred to as executive transport). Many have been diverted (just as **L-17's** were during the Korean conflict) to Vietnam to perform many support missions in the tactical zone.

U-21A's are not being procured for assignment to any CONUS activities for other than test purposes.

The **U-21A** will be unpressurized and will have a large cargo door. Pressurization would cost 500 lbs. of the 2,000 lb. cargo capacity. Since the mission of the aircraft is a utility mission for comparatively short haul, the value of the increased payload over pressurization justifies the configuration. If this aircraft were being procured for administrative mission support it would undoubtedly be pressurized.

* * *

Again, please accept my sincere thanks and appreciation for your outstanding accomplishments in 1966 and I earnestly wish for you and yours a happy and prosperous 1967.

By
MORRIS G. RAWLINGS
Boeing Vertol Division

cost/effective ARMY AVIATION

IT'S a lucky thing for all of us that objective thinking and impersonal analysis happens only in spurts – and is then quickly ignored. If it were the rule rather than the exception, we'd be in a bad way.

Flying would be left strictly for the birds (*Why take a chance?*); golf courses would fold (*Who has time for recreation?*); and all marriages would have to be made in heaven (*Why take on extra responsibilities?*).

Mrs. Ben Schlaffenwetter, who cold-bloodedly weighed the advantages and disadvantages of marrying Ben long before he proposed, decided against it. However, when she noticed how his nose crinkled as he tried to find words for the proposal, her knees went limp and her objective thinking went out the window.

Scales, rulers, and computers can weigh and measure – only men can determine the value of such measurements.

"Good enough for me"

When an Army Aviator is asked if Army aviation is effective in its performance of military functions, he is hard-pressed for an objective answer. Usually, the response is subjective, and is a reiteration of the accepted fact that he and his crew have done everything asked of them and a great deal more. This, frankly, is good enough for him – *and good enough for me.*

It does not satisfy the incumbent caretakers of the people's power. They require a more detailed accounting of the duty performance of Army aviation; a costing analysis; and a comparison between the cost effectiveness of Army aviation and *all* the alternative means by which comparable results can be obtained. They have a right – and an obligation – to try to get such answers.

Stretching an assumption

The Army Aviator in the field is seldom privy to the mental gyrations of study groups and *ad hoc* committees who can occasionally stretch a single assumption into a full-blown set of conclusions, but he is aware of the numbers of non-combatants who are analyzing, evaluating, recommending, and writing reports. He is also aware of the fact that ACTIV has documented nearly 40 final reports on the effectiveness of Army aviation operations; and, if he has a long memory, he remembers that all controversy between the Army and Air Force regarding aircraft use was settled in August, 1965 by the truce signing of *Major Generals J. H. More* and *Delk M. Oden!*

So, what's the problem? The problem is,

has always been, and will remain, "*Is Army aviation the most cost/effective way for accomplishing the necessary results?*"

Many people are engaged in the effort to attack the problem piecemeal. This is why items of hardware change owners and operators, because *only* the hardware portion, having both substance and a computable cost-for-capability, can be readily measured. Two things are forgotten: (1) It takes an idea – a concept – to create a system; and (2) a working wheelbarrow is more useful than an idle truck.

We should shift the emphasis to other than hardware items; to the concept and the people who make it work. To do so, it is necessary to recognize Army aviation as a system – a system brought into being as the result of a concept, and maintained as a system by men using machines. Let us attempt to justify the system as cost/effective; comparing it with alternative systems, not as *machine* against *machine*.

What's the cost?

The first item in the equation is cost. *What is the cost of the Army aviation system?* I doubt very much that anyone knows. Army aviation, being neither fish, flesh, nor fowl, is not identifiable as a separate budget item. At the risk of so over-simplifying as to appear ridiculous, and using only the *unclassified* sources available to any Army Aviator, let's make an estimate of 1.3 to 1.5 billion dollars per year.

Here's the way that's done:

Our leaders have come to the conclusion that the American taxpayer must allot ten cents of every dollar to insurance so that he will be free to spend the other 90 cents. This is borne out by the fact that national defense spending since 1954 has hovered about the 10% mark of the gross national product.[1] The gross national product is around 500 billions of dollars, and the total thus appropriated for national defense is 50+ billion.

The defense budget has, as an average during the period, allocated funds to the three military services on the basis of 42% Air Force, 32% Navy, and 26% Army.[2] The Army's share of 50 billions, then, would be between 12 and 13 billions. It is important that we determine the major categories for which the Army budget is intended to be spent. To get some idea (still using only *open* sources), let's go to the 1965 Defense Budget as carried by the *National Security Management Review:*

Description	*Budget Amount*	*Assumed Army Share*
Military Personnel	14.7	3.8
Operators & Maintenance	12.4	3.2
Procurement	13.4	3.5
RDT&E	6.4	1.7
Civil Defense	.1	.0
Military Construction	1.6	.4
Military Assistance	1.0	.3
Total	49.6	12.9

In the ball park

In a ROAD division, those personnel associated with Army aviation constitute approximately 2% of the division's strength. In a COSTAR organization, that percentage rises to 6%. In an airmobile division, the percentage nears 20%. (All figures taken from TO&E). When CONUS support personnel (Branch Material) are added, a weighted average indicates that approximately 10% of the total Army strength has something to do with Army aviation.

Major General *William W. Lapsley*, CG, Mobility Command, is the authority for a statement that 330 millions of dollars were being allocated for the purchase of Army aircraft during FY67[3]. This amount nears 10% of the total procurement funds.

That's enough for our purposes here. We are, in popular parlance, "*somewhere in the ball park.*" The Army aviation system has been costed at 10% of the total Army budget, and is between 1.2 and 1.5 billions of dollars per year.

What does Army aviation *do* to pay a dividend on that investment? Does it do so

[1]Page 26, "Organization for National Security," Industrial College.

[2]Page 85, National Security Management Reviews, 1964, Industrial College.

[3]Aviation Daily, 7 March 1966

DOWNTOWN NEW YORK

The oldtimers in AA will be quick to recognize this scene . . . Governors Island, the former Hqs for First U.S. Army. Here's an Army/DHC Buffalo on final during the FAA's Metro Air Support Exercise held Nov. 5. The Wall Street complex provides a base leg for an over-the-building approach. (DHC photo)

more effectively than any other available alternative?

The *Army aviation system* (as opposed to Army aircraft) augments the capability of the Army to perform each of five vital combat functions: (1) Command and control of forces; (2) Conduct of the intelligence effort; (3) Maneuver of forces (mobility); (4) Conduct of necessary fire support; and (5) Support of forces logistically. Army aircraft and their crews perform tasks which, in the opinion of the using ground commander, furnish that increased capability.

Measuring "effectiveness"

The effectiveness of the military is measured by its ability to perform the five functions. The ultimate effectiveness measure is the total success in combat which comes as a result of proper and complete performance of all five.

Army Aviators have long accepted the premise that satisfactory completion of an assigned task represents *total* success, and the effectiveness of the system is but a representation of tasks attempted versus tasks satisfactorily completed.

It all depends on where you sit. The view from the cockpit, flying for the colonel who signs your efficiency report, is clear and unobstructed. The view from outside the cockpit puts the colonel's task assignments (and the colonel) under the analyst's microscope.

Performance of assigned tasks – no matter how thoroughly and competently completed – is *not* the ultimate effectiveness measure for Army aviation. That measure must remain, for the moment, undefined. We must first define "*essential tasks.*"

Is a task essential because the boss tells you to do it? Let's hypothesize that the proper answer is "*Not necessarily.*"[4] Some war criminals are dead because they thought otherwise. An essential task is here defined as one required for the success of the overall mission. Flying ammunition to the battle scene is essential *only* if the ammunition is used during the battle; flying the staff and com-

[4]Sheldon Glueck, "The Nuremburg Trial and Aggressive War," Knopf, 1964

mander to the site is essential *only* if they, as a result of the flight, are able to exert influence which could not otherwise be brought to bear; firing weapons into a suspected area is essential *only* if (1) it is firing and doing damage, (2) it is found, and (3) it is forced to stop.

Under this definition, Army aviation performs very few essential missions. A review of 500 flying hours during the course of both WW II and in Korea discloses a maximum of 20, during which the effort might be construed as essential – 1 hour out of 25 – or 4%. Queries of fifteen Vietnam returnees lead one to a conclusion that the rate of essentiality has but slightly increased, and certainly does not exceed 10%.

Three concrete examples

There is little point to a lengthy discussion which infers that the performance of a single essential task more than repays society for the ninety non-essentials which take up the most time and effort. It is sufficient for our purpose here to show the Army aviation system does perform some essential tasks even though they are few and far between. Here are three concrete examples; any Army Aviator in Vietnam can furnish more:

– *World War II.* A *Cub* belonging to the 70th Infantry Division, while on a routine artillery mission, carried an observer who saw enemy troops wiring demolitions to a bridge across the Saar River. By adjusting artillery fire on the far bridge approach, the enemy troops were kept from completing the wiring and the bridge remained intact for crossing by friendly troops. Because time and lives were saved, the mission can be considered *essential.*

– *Korea.* An HO-5 helicopter pilot of the Marine Division performed a night evacuation of two wounded men from the vicinity of Marilyn's Jugs to a hospital ship in the harbor at Inchon. Without the flight, the surgeon said, both men would have died. The flight was *essential.*

– *Vietnam.* The pilots of an Armed CH-47 belonging to the 53d Provisional Detachment attacked ambushing enemy forces who had pinned down and blooded a friendly unit. Because the ambushed force was pinned down, had suffered casualties and was still doing so; and because a later check showed enemy losses inflicted by helicopter weapons, the flight can be considered *essential.*

Alternatives considered

Are these essential missions most appropriately assigned to Army aviation? This entails a consideration of alternatives and requires a definition of that term. An alternative to Army aviation is any tool which (1) is available to the commander at the time and place of his need; (2) is capable of performing the task(s) required with an equivalent degree of efficiency, and (3) is dependable in the sense that it will remain both available and capable throughout the task performance. To the ground commander, there are a limited number of alternatives. *Table I* attempts to list the alternatives under each of the tactical functions and evaluate each for availability, capability, and dependability.

Only the higher headquarters *and* the Army aviation system operate in all of the five functional areas. This is important during that period when the line of demarcation between functions begins to disappear; e.g., the requirement to gain intelligence is matched with an equivalent – and simultaneous – need to act on the intelligence gained.

The availability of the system is assured by the simple fact of its organic ownership. The men and machines which make up the system are assigned to those units which have a constant and continuing requirement for their services. Those units which have an occasional requirement find aircraft available from the next higher headquarters. *No other alternative is as available to the ground commander throughout the five functions as is the Army aviation system.*

Capability of the system

Capability of the system to completely perform all tasks incidental to the successful accomplishment of the function must also be considered. The Army aviation system performs tasks in four of the five functions with an acceptable degree of efficiency. In one, *Fire Support*, it is lacking in capability and can perform only selected tasks.

It is in this area – capability – that system

effectiveness is most questioned, and here that the hardware problem is held to be paramount. Army aircraft are neither the largest, nor the fastest, nor the most sophisticated in design. They do not need to be. The system continually searches for improvements in capabilities; but not solely from the hardware. That developed technique which utilizes terrain-following will *not be improved* upon by increasing the lift capability of the aircraft; accurate, single-shot target destruction is *not improved* by doubling flight speed; and the requirement for seeing the enemy is *not met* by sophisticated designs which permit non-visual flight.

Army aviation is capable of performing the tasks for which it was designed. As tasks are added, additional capabilities are required; some of which must come from hardware. At this moment in time, the capability to perform tasks relating to mobility is more pronounced than the capability to perform fire support. This reduces the overall effectiveness of the Army aviation system.

The third consideration is *dependability*. Dependability as earlier defined, has two major components; (1) that the system, once assigned, will not be diverted without the consent of the ground commander concerned; and (2) that the system will not fail throughout the course of the mission.

Army aviation, once assigned, is removed from that assignment *only* upon mission completion or by direction of a higher command which has coordinated the diversion with the affected commander. To that extent, it is totally dependable.

The system is, however, subject to the con-

TABLE 1—COMMANDER TOOLS

Tactical Function	Alternatives	Available	Capable	Dependable
Intelligence	Higher Headquarters	Always	Usually	Always
	Engaged Troops	Always	Usually	Usually
	Patrols	Usually	Always	Usually
	Air Force	Occasion.	Usually	Usually
	Army Aviation	Always	Usually	Usually
Command Control Commo	Higher Headquarters (1)	Always	Always	Always
	Signal Units (2)	Always	Usually	Usually
	Commander & Staff (3)	Always	Always	Usually
	Army Aviation (4)	Always	Usually	Usually
Maneuver/ Mobility	Higher Headquarters	Usually	Occasion.	Occasion.
	Organic Transport	Always	Usually	Always
	Army Aviation	Always	Usually	Usually
	Air Force	Occasion.	Usually	Usually
Fire Support	Higher Headquarters	Usually	Usually	Occasion.
	Organic Weapons	Always	Usually	Always
	Supporting Artillery	Usually	Usually	Always
	Army Aviation	Usually	Occasion.	Usually
	Air Force	Occasion.	Usually	Occasion.
Logistical Support	Higher Headquarters	Usually	Always	Usually
	Organic Surface Transport	Always	Usually	Always
	Army Aviation	Always	Usually	Always
	Air Force	Occasion.	Usually	Usually

REMARKS: (1) For mission assignment (2) For communications (3) For mission command (4) For mission commo/control

COST EFFECTIVE/AA

(Continued from Page 21)

straints of maintainability and survivability. At least one alternative system is more dependable in each fuction; yet, no alternative is equally dependable throughout the five functional areas. Again, the effectiveness of the Army aviation system is degraded by limitations on its degree of dependability.

Cost: $1.5 billion

Let's review the bidding. We have costed the Army aviation system at 1½ billions annually and have shown it as essential not more than 10% of the time. We are unable to make a costing comparison between the Army aviation system and other alternatives for there is no basis for comparison. *Who can cost the chain of command? How much of Ambassador Lodge's salary and expenses and how many of Air America's flying hours are properly chargeable to the function of military intelligence?* Since no alternatives other than the facilities of a higher headquarters and the Army aviation system operate in all functional areas, only these offer any possibility for the comparison.

Effectiveness, too, leaves us without a firm footing. At least one alternative to Army aviation is more capable or more dependable in each functional area; yet, none is as consistently capable and dependable throughout the entire spectrum. Calculus offers an equation, and analysts are familiar with the process of mathematically causing effectiveness to be the product of three independent variables. However, judgment alone is used to establish the value of each variable. Because no analyst is secure in assuming a single value for a judgmental item, he establishes a range of values for each, and offers a series of answers to the decision-maker.

SPECIALISTS Tony M. Ross (left) and Jack A. Smith, with the 1st Aviation Brigade's 334th Armed Helicopter Company, prepare one of their new rapid-firing miniguns. Just being received in Vietnam, the weapons system closely resembles the Old Gatling gun in that it employs six rotating barrels.

SECOND AWARD

GENERAL William C. Westmoreland presented the Valorous Unit Award to the 114th Assault Helicopter Company of the 13th Aviation (Delta) Battalion, in mid-December ceremonies for extraordinary heroism in action against a hostile force on June 28, 1964. The 114th had previously received the award for its actions against the VC on April 4-6, 1965, and the Meritorious Unit Commendation for action in Vietnam from July, 1963 to June, 1964. LTC Robert I. Stoverink, 114th CO, accepted the award for the company at Vinh Long ceremonies.

Conclusions

Consequently, the analyst's report, stripped of excess verbiage and confusing formulae, is this:

- If availability is of greater value than any other single criterion, Army aviation is the most effective alternative.
- If any other single criterion has a value exceeding that of the remaining two, then Army aviation is not the most effective.
- If all criteria are of equal value, then Army aviation is the most effective of the alternatives.

We postponed a definition for the ultimate effectiveness measure of the Army aviation system. Here it is. *The ultimate effectiveness measure of the Army aviation system is 100% confidence in the Army's ability to determine from its responsibilities the most appropriate machinery for discharging them.*

The evaluation will, like all others having to do with men, be arrived at subjectively. Further "study" by analysts will furnish employment only – it will not develop answers. After all, if analysis could furnish all the answers, who needs decision-makers?

TOP GUN!

A DETAILED REPORT ON A UNIT'S AERIAL GUNNERY COMPETITION

By
COL. RAYMOND P. CAMPBELL
Commanding Officer,
12th Combat Aviation Group

IN early October, the 12th Combat Aviation Group culminated an intensive four-month armed helicopter gunnery training program by recognizing the 118th Assault Helicopter Company's *Bandits* as "*top gun*" platoon at an awards ceremony at Bien Hoa, Vietnam.

While not an AAAA function in any form, the final competitions held by the 12th were similar in format and approach to those sponsored by the Army Aviation Ass'n and conducted by the 10th Aviation Group at Fort Benning, Ga. in June, 1966. As you recall, these were conducted with the approval of *MG Robert H. York*, CG of The Infantry Center, and were supported in terms of trophies and pre- and post-meet publicity by the AAAA as the forerunner for a worldwide "*All-Army Annual Gunnery Crew Championship.*"

Inadequate fire control

In Vietnam, we noted cases of "hosing down" targets and placing inaccurate fire during '66 combat actions. Inadequate fire control appeared to be the cause. In making a detailed check of the battalions of the 12th, we found that while many gun crews were well trained, a few gunners were inadequate.

Probing further, we determined that inadequate aerial gunnery training time and facilities were responsible. The whole problem was complicated by the fact that several of the units, which had been in Vietnam for a long time, had developed unique – and sometimes questionable – gunnery procedures of which they were very proud.

Multi-level competition

Publication of an aerial gunnery training program – at a level that could be handled concurrently with the combat mission of the units – was the first step towards improving our gunnery techniques and crew teamwork. A training program was initiated at the company level in June, 1966, one that proceeded through a battalion-level competition and pointed toward a group-level meeting of the top gun crews. By providing a tangible competitive goal towards which crews could train – "*top gun*" status – we felt that participants would expend greater efforts towards attaining precision in marksmanship and control of weapons. Most of the gunnery training was done on combat missions or en route home from them.

At the same time in June, the CG of II Field Force, Vietnam, gave his approval for a small number of helicopters to be assigned to the training mission each day. This command support, coupled with the battalion commanders' acquisition of training ranges and the issuance of sound training directives, were all the impetus needed for the aggressive

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TOP GUN!

(Continued from Page 23)

pursuit of better gunnery techniques by all of the 12th's armed helicopter crews.

Chosen: A small target

During the period September 15-22, *Major John C. Bahnsen*, Assistant S-3 and later Group Project Officer for this task, conducted the "finals" of the armed helicopter standardization point target gunnery training program and test. His goal was to determine the "*top gun*" of the Group by testing each assault helicopter company's entry.

Firing took place at a point on the Dong Nai River, a half mile wide and just north of Bien Hoa Air Base, using 55-gal. barrels as point targets. The latter were selected intentionally in being very small targets for helicopter weapons. We felt that any crew trained to hit a target of this size consistently would be able to provide more effective and better-controlled combat fire when called upon, with significantly greater safety for friendly troops.

The ground rules . . .

Using all machine guns on the XM-16 equipped armed helicopters, as well as six 2.75" rockets, the selected crews made firing passes in an attempt to sink the barrel within the specified time limit. The ground rules prohibited overflying the target, going below 200' absolute altitude, and flying at an airspeed less than 60 knots.

A maximum of fifteen minutes time was allowed in which to sink the barrel to provide average times that would be meaningful. A complete miss on any one run cost the competing crew the full fifteen minutes, and by doing it this way, the crew could remain in the running since the times of their several runs were averaged.

Each crew was required to fire against four separate barrels, which were dropped individually from 1,000' by a controller aircraft. Stopwatch time from "barrel drop" to "barrel sinking" measured the crew's effectiveness. An "opinion factor" could not enter into this system under these rules of scoring.

Most valuable was the fact that participating crews and other observers were able to watch the tactics and techniques of other units at close range, thereby profiting from this exposure. In addition, much informal exchange of information took place on the ground. For the first time, proponents of each gunnery technique were required to demonstrate in public the good points – and in some cases, the bad points – of their "technique." Self-styled experts had a chance to prove their expertise. When the *times* and the comments came in, the educational process was both swift and effective.

"Effectiveness" charted

Note the dramatic improvement in effectiveness in the *time* of each crew as it progressed through the competition and after it had the opportunity to observe others in action:

Table I
Times for Sinking Barrel
Preliminary Firing Runs

1st place ..... 118th *Bandits*			
6:24	6:02	6:09	2:44
2nd place ..... 68th *Mustangs*			
15:00	4:42	4:01	6:11
3rd place ..... 116th *Stingers*			
10:28	6:03	7:05	8:05
4th place ..... 173rd *Crossbows*			
13:10	11:20	12:06	6:33
5th place ..... 197th *Sabers*			
15:00	12:49	11:14	4:29
6th place ..... 128th *Gunslingers*			
15:00	7:19	–	–
7th place ..... 162nd *Copperheads*			
15:00	15:00	10:19	7:09
8th place ..... A Co, 501st *Firebirds*			
15:00	15:00	15:00	12:38

Table II
Times for Sinking Barrel
Final Firing Runs

1st place ..... 118th *Bandits*		
4:01	3:17	(3:39 average)
2nd place ..... 68th *Mustangs*		
3:27	4:11	(3:48 average)
3rd place ..... 116th *Stingers*		
5:19	6:40	(5.58 average)

● The armed helicopter machine gun (M6 kit) can, in fact, be used to hit and to destroy

point targets. Since we engage running VC in the open occasionally, and often must fire very close to friendly units, positive control of gunfire is vital.

● Firing machine guns into a water background shows graphically the dispersion pattern found in each set of aircraft weapons, good or bad. Zeroing over water is also an effective method to determine the size of "shot groups" of both rockets and machine guns for possible later correction of boresighting.

● The "*top guns*" had much better crew integrity and cooperation than the less effective crews. The pilots, for example, flew short teardrop courses, rather than the long racetrack patterns, and their door gunners fired longer and better.

● The "*top gun*" pilots held attitude and airspeed steady during their firing runs to give all of their gunners the best chance to find and hit the target. Pre-flight zeroing, boresighting, and weapons checks by the bettter ground crews contributed materially to keeping the weapons firing.

● The "*top guns*" also had made several ingenious modifications in the loading of ammunition, in the feed chuting and belt drives, and in the disposal of spent cases, each of which led to a material improvement in weapon effectiveness. They also determined that the M5 boresighting telescope, when used without its 40mm adapter, fits snugly into the flash hider of the M60 machine gun and permits the precise boresighting of that weapon.

● All units of the 12th need refresher gunnery training at regular periods, both to maintain a high degree of proficiency and to compensate for the large number of replacement personnel they receive daily.

We can't help but think that the advent of the new weapons systems for the UH-1B will be a blessing indeed for all gun ship crews. Then too, the use of the *HueyCobra* in Vietnam should prove revolutionary. We await both of these developments eagerly.

TOP GUN!

(Continued from Page 26)

The idea of having an *Armed Helicopter Gunnery Competition* in CONUS along these lines seems to have much merit. We believe that the resultant training value and competitive spirit derived would far outweigh the cost. We believe that an uncomplicated, definitive scoring system in such meets is a *must*, and that shooting at barrels in water abets such a system.

Seeing is believing!

Of particular value is the fact that such meets would prove or disprove the many personal notions that crews develop as to "*better ways to do it*," which are different from the approved systems. All recognize that innovation is desirable and should be encouraged, but that any and all innovations should prove themselves in practice. This type of competition presents very convincing arguments for the best way.

First Place Gun Crew of the 118th Assault Helicopter Company "Bandits" were, left to right, CW2 Wyburn H. Burroughs, WO1 Marvin W. Schmidt, Crewchief Sp4 Richard Wehr, and Gunner PFC Payton Crawford, III.

Second Place Gun Crew of the 68th Assault Helicopter Company "Mustangs" included, l. to r., CPT Richard C. Ragland, CPT Sonny Blackburn, Crewchief SP5 Richard B. Bone, and Gunner SP4 John T. Hughes. (USA photos)

The Night DOESN'T Belong To Charlie!

BY MAJOR JAMES R. ALLAN

Analysis and Management Division, USARV Aviation Division

The coming of nightfall was once the greatest period of activity, safety, and confidence for the Viet Cong. The night belonged completely to Charlie — to operate, resupply, or move as he saw fit. During this past year and especially during recent months, the respite of nightfall has rapidly begun losing its value as an ally of the Viet Cong. With increasing frequency large and small scale operations are continuing into the hours of darkness and through the next day.

As a natural consequence, night time employment of Army aviation is continually increasing in scope and application. Let's look at some of the highlights involving night operations as reported on the daily OPREP-5 to the **Analysis and Management Division.** While not every unit is mentioned, these are representative of what is happening in Army aviation here in Vietnam.

A maximum effort in support of one of the larger ground operations last month found most of the **11th, 13th** and **145th Combat Aviation Battalions** committed in support of the **Big Red One's** aviation battalion. The combined efforts of these units, flying day and night, added a large degree of flexibility to what was already a highly successful ground operation.

It started out as a routine extraction of an infantry battalion when the enemy suddenly attacked, turning this segment of the battle into a full scale fire fight. Instead of bringing troops out, more were brought in, positioned, and repositioned throughout the night.

Statistics for this portion of the engagement (10 hours) are astounding; over 2,500 personnel were airlifted and in excess of 250 tons of artillery, ammunition, and other cargo were moved. Reports of individual persistence and devotion to duty abound. For example, three helicopters of the **173d Assault**

Helicopter Company received intense fire and multiple hits (one in excess of 20) while operating in and out of the pitch black LZ's but continued their mission until after daybreak.

A few days later, in support of the same ground operation and after flying a number of combat assaults during daylight hours, the **11th Battalion** was called upon to provide emergency tactical airlift in the early evening. Responding immediately, the assault helicopters of the battalion flew well into the night, airlifting over 1,500 troops and 80 tons of ammunition into extremely difficult terrain.

Further on in the operation, the **178th Assault Support Helicopter Company** lifted 312 tons of desperately needed supplies and more than 250 personnel in the around-the-clock effort. This was conducted without mishap despite intense small arms fire being received in all landing zones, and was a silent tribute to the courage and professionalism of all concerned.

And more . . .

The 10th Combat Aviation Battalion in another Corps area is also keeping the adversary off balance with night operations. One ground effort supported by the **48th Assault Helicopter Company** saw the aviators of this unit fly over 200 hours while lifting 540 troops and almost 15 tons of cargo. This impressive accomplishment was completed in one late evening night mission.

In sampan country, the **Delta Battalion** continues to make it expensive for the Viet Cong to use this mode of transportation under what once was the "cover of darkness." One 24-hour tally for the **13th** added up to more than 60 sampans destroyed, most of these during night river patrols.

During the abortive Viet Cong night attack on Tan Son Nhut airbase re-

THE NIGHT DOESN'T BELONG

(Continued from Page 29)

cently, the **"Razorbacks"** (gunships) of the **120th Assault Helicopter Company** were airborne and in the middle of things within minutes. The following was extracted from the MACV message summarizing the attack:

"3. (U) Brunt of highly successful ground operations borne by U.S. Air Force with close air support furnished by U.S. Army."

The examples recounted above serve once again to illustrate the overwhelming advantages of airlift and gunfire support furnished by "flying soldiers" who are organic members of the Army Team, and who possess a complete understanding, empathy, and appreciation of the ground commander's needs and requirements and do something about them, regardless of the time of day.

Rope ladder payoff!

Moving on now to other operations not necessarily conducted at night, it is obvious that training conducted by the **178th Assault Support Helicopter Company** in the use of the "rope ladder" recently paid off in the jungles of their operational area. A landing zone was needed where there wasn't any. A 33-man engineer team from the **196th Infantry Brigade** was inserted into the heavy forest by ladder from a hovering **Chinook,** followed by over 4,000 pounds of demolitions. The engineers soon cleared and prepared an LZ where it was most needed at the time.

What started as a routine day for the **52d Combat Aviation Battalion** in support of a long, continuing ground operation suddenly erupted into full scale enemy contact, with heavily engaged ground troops requesting immediate resupply and reinforcement. The battalion's helicopters responded and within an hour had air-landed 220 troops and over 30 tons of cargo and ammunition. Gunships escorting the troop carriers played an important part in this action providing fire support to the ground troops long after the departure of the "slicks."

Crew members of three helicopters belonging to the **116th Assault Helicopter Company** were witnesses to the crash of another helicopter recently. Disregarding their own safety they plunged into the burning aircraft, extracted the injured, and rushed them to prompt medical attention. Once again, men's lives were saved by the unselfish devotion of their comrades.

Closing out this month's edition of **Army Aviation Operational Statistics in Vietnam** we find overall performance data on the upswing again after a slight slowdown during the last period. Here are the unclassified, gross figures in round numbers: enough passengers moved to equal more than one airlift for each U.S. military member of all services in country, (470,000 passengers); over 128,000 flying hours, or the equivalent of 177 aircraft flying 24 hours a day for the 30-day period.

The other related figures are as equally impressive: more than 40,000 tons of cargo moved and in excess of 300,000 sorties flown! These sorties, tonnages, and passengers were flown by formations ranging in size from entire aviation battalions to light fire teams supporting a heavily engaged outpost in the middle of the night. Each individual mission, important in itself, when added to all the others, truly represents a tremendous and irreplaceable contribution to the counter-insurgency effort here in Vietnam.

This article has been reprinted from the December, 1966 issue of the *Aviation Pamphlet*, Headquarters, U.S. Army, Vietnam.

A QUICK LOOK AT ECOM'S AVIONICS LABORATORY

SOMEONE once said, "*Army aviation is not a fly-by-night outfit, but with better Avionics it will be.*" Perhaps this is as fair a statement as any on one of the main goals of the U.S. Army Electronics Command Avionics Laboratory: to provide Army aircraft with the means to operate with equal facility in daylight, darkness, or restricted visibility.

Increasing U.S. Army emphasis on airmobile operations, highlighted by the deployment of the 1st Air Cavalry Division to Vietnam, is having a profound impact on ECOM's Avionics Laboratory at Fort Monmouth, N.J.

From an initial strength of 102 civilians and four officers when established in March 1965, the Avionics Laboratory has grown to over 200 civilians and 12 officers.

Avionics is a word contracted from *aviation* and *electronics*. As applied by the Army, avionics includes all airborne electronic equipments and ground systems which are required for the operation of an aircraft. Excluded are mission-type equipments, such as surveillance radars, and electronic warfare systems which are the concern of other laboratories in the Electronics Command.

Broad technical areas

Responsibilities of the Avionics Laboratory encompass the complete R&D cycle, from exploratory research to engineering development and systems integration. To perform its mission, the Laboratory is organized into seven technical areas: *Navigation and Landing, Environment Sensing, Cockpit Instrumentation, Flight Control, Airborne Communications and Antennas, Airborne Systems,* and *Ground Systems.*

Each of the technical areas is concerned with equipments or systems which have their counterparts in the other Military Services. The Army, however, has unique problems imposed by the need for tactical mobility of ground systems; by the need for tactically advantageous low-level, or nap-of-the-earth, flight at night or in reduced visibility; and by the fact that Army aircraft are, in general, smaller than those of the other Military Services.

BY COLONEL LESLIE G. CALLAHAN, JR.

The need for transportable ground systems is exemplified by air traffic control centers which must be designed and built to permit rapid set-up, dismantling, and relocation in a changing tactical enviromnent.

Avionics Laboratory engineers are helping to solve this problem by providing technical supervision for the fabrication, on a crash basis, of a number of air traffic control facilities at the Lexington (Ky.) Blue Grass Army Depot.

Designed in several configurations for either en route or terminal area control, these facilities will give the Army a new degree of flexibility in meeting its increasingly serious air traffic control problems under both visual and instrument flight rule (IFR) conditions.

The Army's need for nap-of-the-earth flight in limited visibility has led to modification of a Mohawk aircraft under direction of the Avionics Laboratory. A terrain-avoidance radar, coupled to the aircraft's automatic flight control system, provides the capability of detecting and displaying terrain features. The pilot may optionally take man-

ual evasive action or allow the aircraft's automatic system to take charge.

The complete system, which provides for input from a radar altimeter and a doppler navigator, is undergoing evaluation by Army Test and Evaluation Command personnel at Fort Huachuca, Ariz.

Application of the latest techniques in microcircuitry and solid-state technology will be primarily responsible for this dramatic decrease in weight with no sacrifice to operational capability.

AAAIS

Army aircraft are becoming increasingly sophisticated and complex, to the extent that serious attention must be paid to reducing the pilot's growing workload. A first step in that direction has been taken with development of the "*Advanced Army Aircraft Instrumentation Systems*" *(AAAIS)*.

AAAIS processes the information from a number of sensors and performs various navigational, fuel management and fail-safe functions which are translated into vertical and horizontal situation displays on separate cathode ray tubes.

The pilot is thus presented with an easily interpreted distillation of the significant data from a somewhat formidable assortment of gauges, instruments, dials and indicators.

An advanced development model of the *AAAIS* has been installed in an aircraft and is currently undergoing an extended period of demonstration to agencies and evaluation by pilots.

With an eye on future generations of Army aircraft, the Avionics Laboratory is involved in a variety of challenging programs expected to enhance present capabilities or provide giant steps toward the realization of currently unavailable capabilities. T.A.S.S.

For the present . . .

A representative sample of equipments to enhance present capabilities would include:

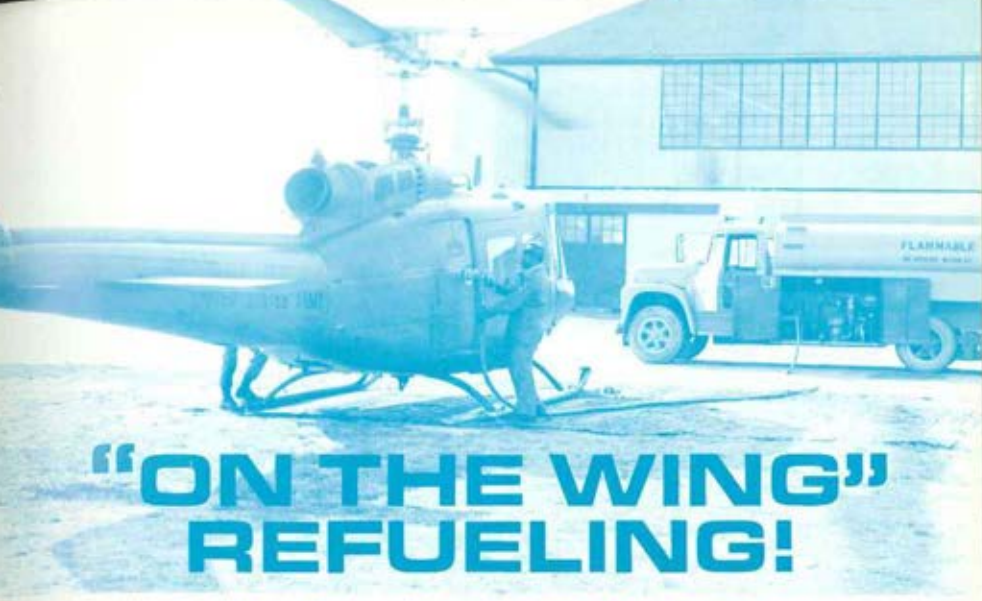
- A radar altimeter to provide accurate altitude indications over ice or snow.
- An improved, lightweight weather radar to pinpoint dangerous storm build-ups.
- A new ground-based navigation system, Loran-D, which is being developed jointly with the Air Force to provide orders of magnitude increases in position-fixing accuracy.
- A gyro-magnetic compass using new suspension techniques to achieve greatly increased heading accuracy.
- Automatic flight control mechanisms to cope with the inherently unstable flight characteristics of anticipated future aircraft.

In development . . .

Equipments which will provide new capabilities include the following items in various stages of the development cycle:

- A Laser-based device which will warn the pilot of impending collision with elevated wires and cables.
- An automatic terrain-avoidance system for helicopters.
- Computers which will automatically and safely control the anticipated dense air traffic of the future.
- A self-contained hybrid doppler inertial navigator of a cost, size, and accuracy compatible with Army requirements.
- A device which will enable flights of aircraft to fly safely in close formation at night or in restricted visibility.
- An electronic system which will give Army aircraft the capability to land safely at night or in bad weather in a tactical environment.

Integrating these devices into efficient and compatible systems will be a fundamental task of the Laboratory's "*Tactical Avionics Systems Simulator*." Designed by Laboratory engineers, it has been used to simulate and analyze simultaneously the avionics, weapons, and aerodynamic subsystems for the "*Advanced Aerial Fire Support System*" *(AAFSS)*, the Army's forthcoming weapons aircraft, with remarkably successful results.



"ON THE WING" REFUELING!

IN an effort to increase the percentage of effective flying hours by reducing the time necessary to perform routine maintenance and service operations, the U.S. Army Aviation Materiel Laboratories (AVLABS), Fort Eustis, Va., has designed and tested an *Automatic Shut-Off Closed Circuit Refueling System.* Initial testing indicates that the new system decreases the time required for helicopter refueling, and results in less maintenance, longer engine life, and extended battery use as well.

Present refueling systems use the conventional gravity feed type and have many inherent disadvantages. Helicopter engines and rotors must be shut down to prevent contamination of the fuel by dust generated during rotor operation. Once the engines are shut down, a waiting period of approximately 20 minutes is required before they can be restarted. This process of shutting down, refueling, and restarting the engines results in loss of valuable flight time.

An in-house research program conducted at AVLABS promises multiple benefits in operations and reduced maintenance costs

In addition, frequent restarting can weaken the battery to the point where an engine "hot start" results, a condition which normally requires the overhaul or replacement of the engine. Another disadvantage found in conventional systems is the need to use a grounding cable from the nozzle to the aircraft to prevent electric charge buildup and release of sparks.

The closed circuit system eliminates the disadvantages of the conventional system by providing a continuous airtight flow of fuel from the supply source to the fuel tank. It incorporates the push-pull concept of mating interlocking parts to provide a "closed circuit" feature.

Specific advantages

Specifically, the closed circuit system is a major improvement over conventional systems in that it:

Permits refueling while the engine and rotors are operating.

Reduces refueling time an average of 50%.

Permits from 15 to 30 gallons of additional fuel to be carried in the tanks of the UH-1 model helicopters.

Reduces susceptibility to fuel contamination.

Eliminates the need for an electrical grounding cable.

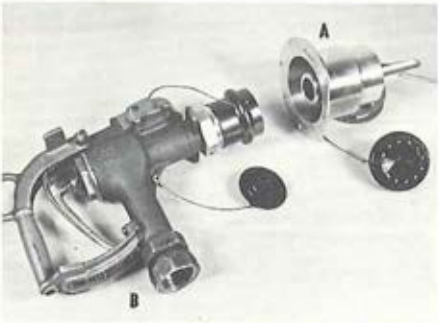
Reduces battery wear that can lead to a "hot start" condition.

The aircraft closed circuit system consists of an automatic shut-off closed circuit nipple mated with an adapter flange to make up the automatic shut-off aircraft filler unit. It also contains an automatic shut-off nozzle modified to accept the closed circuit filler unit.

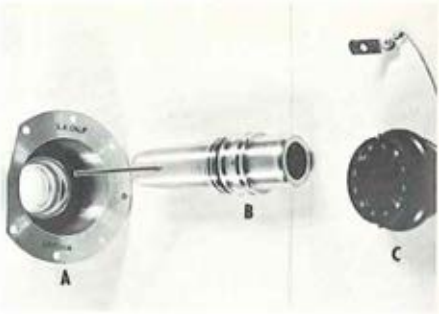
DISCONNECT FEATURE

A quick-disconnect fitting in the system allows more fuel to be put into the tank than present practice permits, because once the fueling nozzle is removed, the opening is automatically sealed. The quick-disconnect feature also enables the helicopter pilot to take off quickly in an emergency.

Approximately 15 minutes is required to replace the conventional fuel cap adapter with the *Automatic Shut-Off Closed Circuit Refueling System.* Helicopters employing the closed circuit refueling system filler unit can be refueled in the conventional manner by removing the automatic shut-off nipple and inserting a conventional refueling nipple into the automatic shut-off nozzle adapter.



The complete automatic shut-off closed circuit refueling system is shown in the photo above. The aircraft adapter (A at top right) and the nozzle assembly (B). Individual dust caps are attached by cables. (USA photo)



A blow-up of two integral parts of the automatic shut-off closed circuit refueling system. Shown above is the aircraft adapter (A) with the shutoff nipple (B) removed. The dust cap and cable are shown at C. (USA photo)

Evaluation of the prototype system was conducted at Fort Eustis, Va., under an AVLABS in-house research program conducted by Francis V. Limandri, Aircraft Equipment Specialist, Aircraft Systems and Equipment Division, from February to April, 1966.

NOW UNDER TEST

At present, this system is undergoing military potential and limited engineering tests at the U.S. Army Aviation Test Board, Fort Rucker, Alabama. Tests are being conducted on various models and a fuel tank simulator is being used to determine durability of the hardware.

Thirty-nine refueling operations were conducted using the closed circuit system, four of which were accomplished with the engines and rotors operating. The UH-1A helicopter was used for this evaluation, but the system could easily be adapted to other types of helicopters and airplanes, as well as ground vehicles.

To date, 2,840 refueling operations have been accomplished on the simulated tank with a total of 42,000 gallons having been pumped.

The page 33 photo is one of an actual refueling conducted at Felker Army Airfield, Fort Eustis, Va., on Dec. 30 with *both* rotors in full swing. Major Carroll M. Fyffe is at the controls of the UH-1D.

Automatic Shut-Off Nipple being removed to refuel conventionally

Automatic Shut-Off Nozzle being attached to conventional refueling nipple

Automatic Shut-Off Nozzle attached to conventional refueling nipple

Automatic Shut-Off Nozzle and conventional refueling nipple during refueling operation

THE USE OF AN ADAPTER PERMITS CONVENTIONAL REFUELING OPERATIONS

Automatic Shut-Off Nipple completely inserted in Adapter mouth

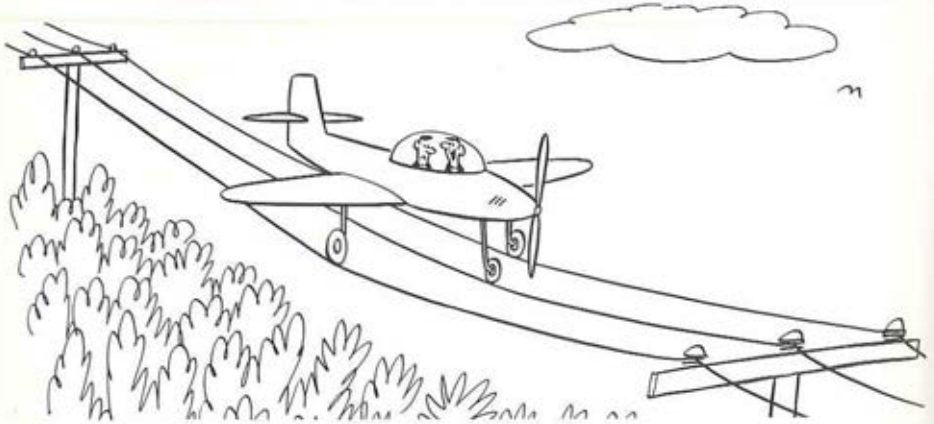
Automatic Shut-Off Nozzle being inserted for automatic shut off refueling operation

Automatic Shut-Off Nozzle inserted into Adapter mouth and ready for refueling

THE LIGHT SIDE

—SIKORSKY NEWS

"Want to see some flying saucers?"



"I couldn't do that again in a hundred years!"

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OBITUARIES

SYLVAN K. BRADLEY

Captain Sylvan K. Bradley, an Army Aviator assigned to the 1st Infantry Division, died due to hostile action in Vietnam on November 10, 1966. He is survived by his widow, Mrs. Francis Ann Bradley, 242 North Church Street, Sullivan, Missouri.

JAMES W. BRUHN

Warrant Officer James W. Bruhn, an Army Aviator on assignment to the 162nd Assault Helicopter Company, died due to hostile action in Vietnam on November 15, 1966. He is survived by his parents, Mr. and Mrs. Hans C. Bruhn, 1008 South Street, Alma, Nebraska.

WILLIAM F. CALLINAN

Major William F. Callinan, an Army Aviator assigned to the 52nd Aviation Battalion, sustained fatal injuries when his UH-1D helicopter crashed in Vietnam. He is survived by his widow, Mrs. Marilyn Ann Callinan, 843 Bunker Hill Road, Columbus, Georgia.

JOHN W. CLAYTON

Captain John W. Clayton, assigned to the 135th Aviation Company, sustained fatal injuries when his CV-2 aircraft crashed in Vietnam. He is survived by his widow, Mrs. Yuriko Clayton, 38 Ross Avenue, Columbus, Georgia.

LOUIS D. EASTERDAY

Captain Louis D. Easterday died as a result of injuries received in the crash of his aircraft during a training mission. The accident occurred near Marianna, Florida, on December 20, 1966. He is survived by his widow, Mrs. Sharon Kay Easterday, c/o Mr. Donald Dickison, Route No. 1, Garrett, Indiana.

JAMES W. LEACH

Chief Warrant Officer James W. Leach, an Army Aviator assigned to the 1st Cavalry Division (Airmobile), sustained fatal injuries in the crash of a CH-47 helicopter. The accident took place in Vietnam on November 18, 1966. He is survived by his widow, Mrs. Martha S. Leach, Route 2, Magee, Mississippi.

JOHN T. LYONS

Second Lieutenant John T. Lyons, an Army Aviator on assignment to the 507th Medical Company (Airmobile), Fort Sam Houston, Texas, died as a result of injuries received in the crash of a OH-23D helicopter on October 10, 1966. He is survived by his widow, Mrs. Katherine N. Lyons, 401 Northwest 4th Avenue, Mineral Wells, Texas.

TERRENCE M. ROONEY

Warrant Officer Terrence M. Rooney, assigned to the 117th Aviation Company, died during hostile action in Vietnam on November 11, 1966. He is survived by his father, Mr. William P. Rooney, 3010 Umatilla Street, Denver, Colorado.

DAVID L. SIVERLY

First Lieutenant David L. Siverly, on assignment with the 116th Aviation Company, died as a result of injuries received in the crash of a UH-1B helicopter. The accident occurred in Vietnam on November 28, 1966. He is survived by his widow, Mrs. Alice Siverly, P.O. Box 54, Oakville, Iowa.

LLOYD S. SMITH

First Lieutenant Lloyd S. Smith, an Army Aviator assigned to the 1st Infantry Division, died during hostile action in Vietnam on November 10, 1966. He is survived by his widow, Mrs. Jean A. Smith, 704 Washington Street, Decorah, Iowa.

MILTON F. SMITH

Captain Milton F. Smith, an Army Aviator on assignment to the 52nd Aviation Battalion, died as a result of injuries received in the crash of a UH-1D helicopter in Vietnam on November 11, 1966. He is survived by his widow, Mrs. Cathleen Smith, 8026 Glendale Road, Chevy Chase, Maryland.

WALTER R. SPEARE, III

Captain Walter R. Speare, III, assigned to the 119th Aviation Company, died during hostile action in Vietnam on November 11, 1966. He is survived by his widow, Mrs. Barbara J. Speare, 919 Dakota Avenue, Medford, Oregon.

DEE W. STONE, JR.

First Lieutenant Dee W. Stone, Jr., on assignment with the 119th Aviation Company, died during hostile action in Vietnam on November 11, 1966. He is survived by his parents, Mr. and Mrs. Dee W. Stone, Sr., 16 Brandywine, Brielle, New Jersey.

BILLY J. WAYMIRE

Chief Warrant Officer Billy J. Waymire, assigned to the 1st Cavalry Division (Airmobile), sustained fatal injuries when his CH-47 helicopter crashed in Vietnam on November 18, 1966. He is survived by his widow, Mrs. Audrey D. Waymire, 520 Ellen Drive, Little Rock, Arkansas.

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AAAA NEWS

USAREUR Convention to Feature Army-Industry Presentations

Expected to be the most significant event of the year professionally for USAREUR aviators, the **Seventh Annual Convention** of the **USAREUR Region of AAAA** will be held at the U.S. Army Recreation Area, Garmisch, Germany, during March 8-11. The three-day gathering will bring together senior Army officers from D/A and USAREUR, USAF specialists, German Army helicopter experts, alpine aviation operators, U.S. and European industry representatives, aand Army aviation personnel from USAREUR.

Some 300-400 members and their families are expected to attend the combined professional and social activities. The tentative program includes presentations on each of the three mornings of March 9-11, with the afternoon and evenings left open for recreational and social activities. **"Army Day"** will be March 10; **"Industry Day"** is March 11.

Conferees are shown during one of the '66 meeting's professional sessions.

The Annual USAREUR Region **"Awards Banquet"** will conclude the convention on March 11, and features AAAA Awards to the Region's **"AA of the Year," "Aviation Soldier of the Year," "Outstanding Aviation Unit,"** and **"Outstanding Aviation Support Unit."**

Major General David B. Parker, Commanding General of the Seventh U.S. Army Support Command, serves as President of the **USAREUR Region** and is coordinating the convention's administration and programming through the AAAA Project Officer of the Host Unit, the 504th Aviation Battalion of the 4th Armored Division, APO New York 09696.

Colonel James W. Sandridge, Jr., Regional VP for Industry Affairs, U.S. Army Aviation Maintenance Center, APO New York 09028, is coordinating the attendance of industry representatives and details regarding industry presentations.

Reactivation Meeting

The Fort Bragg Chapter of AAAA will hold a "Reactivation Professional-Social Membership Meeting" on Saturday, February 18, at the Fort Bragg Officers Open Mass. Mothballed during 1966 due to heavy personnel commitments to the Dominican Republic and Southeast Asia, the Chapter has regained substantial part of its former 230-member base, and plans increased AAAA activities throughout 1967. **LTC Garald L. Waldron,** Office of Personnel Operations. D/A, will discuss the "Personnel Picture" from the aviator's standpoint as Chapter Guest Speaker for the evening.

AAAA FOUNDATION OFFERS $3,500 IN SCHOLARSHIP AID

The AAAA Scholarship Foundation announces the availability of $3,500 in 1967 scholarship assistance funds for the sons and daughters of members and deceased members of AAAA.

Application forms for the 1967 scholarships may be obtained by writing to the AAAA Scholarship Foundation, Inc., 1 Crestwood Road, Westport, Conn. 06880. The applications, together with other supporting application data, must be returned to the Foundation on or before March 1, 1967 to receive Awards Committee consideration.

ELIGIBILITY

Eligibility requirements for the awards have been minimized. The applicant must be:

The son or daughter of a member or deceased member of AAAA.

A high school graduate or senior who has made application to an accredited college or university for Fall, 1967 entrance as a freshman, or who has been accepted for freshman enrollment in the Fall of 1967.

Unmarried and a citizen of the United States.

AREA INTERVIEWS

Following the receipt of the completed application form, the financial statement, and the required academic transcripts, the Foundation will notify the applicant to report to a group of interviewing officers selected from among the AAAA membership residing in the applicant's area. The "Report of Interview" serves as an important, (but not mandatory) part of the documentation required for awards consideration.

FINAL SELECTION

The final selection will be made by the AAAA National Awards Committee, a permanent standing committee of the National Executive Board of the AAAA that has been designated as the Foundation's judging agency. The selection will be made during the month of March, 1967 period with the winners to be notified by March 31, 1967.

BACKGROUND

Incorporated in December, 1963, the AAAA Scholarship Foundation, Inc. is a separate non-profit education activity created to administer scholarship assistance to the children of members.

The previous scholarship recipients have included Joel R. Graft (1963); Danny P. Barrett, Cheryl Ann Cretin, Roger A. Moseley, and Robert P. Spears (all in 1964); and Harmon B. Dow, Kathryn M. Eggers, Penny L. Francis, Jessica Ann Fried, Joseph W. Hely, Jr., Michael E. McMaken, and Leslie T. Schockner (all in 1965).

The seven 1966 scholarship winners included Laurie Jo Davis, Eugene F. Geppert, Joseph J. Lahnstein, Roxanne Roehl, Robert P. Thomson, Chauncey L. Veatch, Jr., and Betty R. Williams.

With the issuance of the 1966 scholarship assistance, the AAAA Scholarship Foundation has provided $9,700.00 in direct aid to seventeen students since the inception of the program in 1963.

Memorial Scholarship

The initial $250 "Ross J. Paterson Memorial Scholarship" will be offered through the AAAA Scholarship Foundation to 1967 applicants. Donated from a fund created to honor the memory of Warrant Officer Ross J. Paterson, the scholarship will be awarded in two successive years. Paterson was killed in Vietnam on February 16, 1966, while serving with the 1st Cavalry Division (Airmobile).

The donors have requested that primary consideration be given to those applicants who are orphans of aviators or crew members.

ARMY AVIATION

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