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UNITED STATES ARMY MARCH 1972

AVIATION DIGEST

What do these two men have in common? See the back cover

UNITED STATES ARMY AVIATION DIGEST

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ABOUT THE COVER

Photographs of the Guardsmen on the covers of this special Reserve Components issue are by Captain Tom Greene

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

The DIGEST is an official Department of the Army periodical published monthly under the supervision of the Commandant, U. S. Army Aviation School. Views expressed herein are not necessarily those of Department of the Army or the U. S. Army Aviation School. Photos are U. S. Army unless otherwise specified. Material may be reprinted provided credit is given to the DIGEST and to the author, unless otherwise indicated.

Articles, photos, and items of interest on Army aviation are invited. Direct communication is authorized to: Editor, U. S. Army Aviation Digest, Fort Rucker, Ala. 36360.

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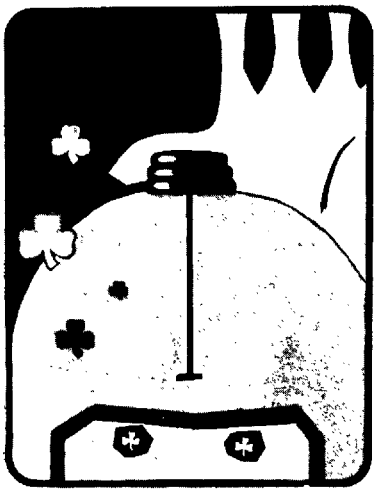
VIEWS FROM READERS



Sir:

Being responsible for the success of Army aviation in the Idaho National Guard has taken on a new and tremendously increased significance. In short, the program has almost exploded in our face. Having been an aviator for the past 27 years, I am particularly interested in aviation safety doctrine and the management techniques which will result in our ultimate success.

In discussing the recent growth of Army aviation with some of my colleages, I find that they are having the same growing pains that we in Idaho have recognized. As the active Army is reduced in size and the Reserve Components take on greater responsibility, it seems to me that there is no single area of our concern which demands more attention than Army aviation.

The inclosed comments [General Brooks' article which appears on page 5], while based on the Army aviation program in Idaho, are typical, I feel, of the problems which the Guard faces. They are, therefore, submitted as being of possible interest to your readers. I am sure there are others who have a broader view of the total program than I, however, there is no one who is more concerned about the future of Army aviation in the Guard. I certainly feel someone must call attention to the challenge that we face and our responsibilities for facing this challenge in a professional manner.

BG James S. Brooks
Chief of Staff
Idaho Army National Guard

• Actions being taken by DOD are discussed on page 18.

Sir:

Very seldom do I get to read the DIGEST but I lucked out and found a copy. I was very much in need of your address.

I've been in RVN for 18 months and had almost 1600 hours in the AH-1G. For the last 2 months we have been having trouble with heads on our aircraft. These heads are all rebuilds from the Spartan Company in Oklahoma. The feather bearings are lasting from 2½ to 15 hours and that's the max! We have notified everyone possible about the trouble and have been told that Spartan no longer works for the U.S. However, every bad head we replace is with another Spartan.

We have been ordered to fly the aircraft *as is* as the mission requires it. What can I do? I'm very scared that someone is going to end up in your publication as one of those unfortunate souls who crashed because of an administrative error! I've had three heads on my bird in the last 25 hours and now they say because they are *all* bad, we should just keep on flying. I need to know what I can do and I need to know as soon as possible. Thank you.

CW2 Jerome M. Boyle
H Troop 16th Cav
APO 96490

• The DIGEST received the following from the Aviation Systems Command in response to CW2 Boyle's letter.

Put your fears aside—the failure modes of bearings wearing out, sleeves slipping/cracking, greased bearings, slipping bearings, seals in backwards and all other problems we have and are having with Spartan overhauled hubs can only deteriorate to the extent that the vertical vibrations (2 per rev) will become unbearable and a landing will be called for. This landing, followed by proper maintenance inspection, will reveal the difficulty and hub replacement or proper repair action will be taken.

The following facts are provided to you to give you a clear picture of what is really going on:

(1) Spartan Aviation Corporation has not been canceled from the overhaul business by the U. S. Army.

(2) AVSCOM, Systems Engineering Support Division, Attack Helicopter Branch, Rotors and Power Train Group has, is, and will continue to take corrective action to preclude production line reoccurrence of all identified problems with the overhaul program at Spartan. You can rest assured that we have corrected the one specific problem you cover in your letter. We hope that by some of the data provided above that you can see that we have also corrected problems before and after products hit the field and several problems that you have not covered in your letter.

We do share your concern about unfortunate souls who crash. However no, repeat, no safety-of-flight is involved in any of the problems we have experienced with the Spartan overhauled hubs . . Our concern is centered around the loss of useable time and expense in maintenance manhours created by the extremely low MTTR of the Spartan overhauled hubs.

If this office can be of any further assistance, please contact, L. G. Dite, Autovon 698-6585.

Donald M. Macy
Chief, Attack Helicopter Branch

Looking Into The Future

Brigadier General William J. Maddox Jr.
Director of Army Aviation

Although Vietnam served as the proving grounds for the airmobility concept, Army aviation must continue to strive to meet new goals, adapting itself to new tactical environments, adding advanced military technology to techniques of warfare. The aircraft at right, a SMASH (Southeast Asia multisensor armament system for the HueyCobra) equipped HueyCobra, is one with advanced technology being employed during air cavalry combat brigade testing at Ft. Hood, TX

LAST YEAR'S MEDALS and last year's war stories, while interesting, are not necessarily conclusive. What we did last year may have increased our qualifications and made us stronger and more confident as individuals, but they are not a free ticket to the future. They are only a prologue to the future. What we do on a daily basis counts far more than what is past.

This thought applies particularly to Army aviation. Those of us who *were* Army aviation during the heavy combat days of Vietnam proved the concept of airmobility. But airmobility does not become permanently established at that point. Those of us who *remain* in Army aviation must continue to strive and to meet new goals. We must consider new thoughts and we must adapt to new conditions because warfare and military technology do not stand still.

Therefore, we will talk about where we are at present, as a point of departure, and where we are going. The entire Army is slimming down following a period of expansion and intense combat activity. This is normal following a war. It is also normal for the Army to take stock of itself and adjust itself to the new situation. We in the Pentagon are busy at this right now.

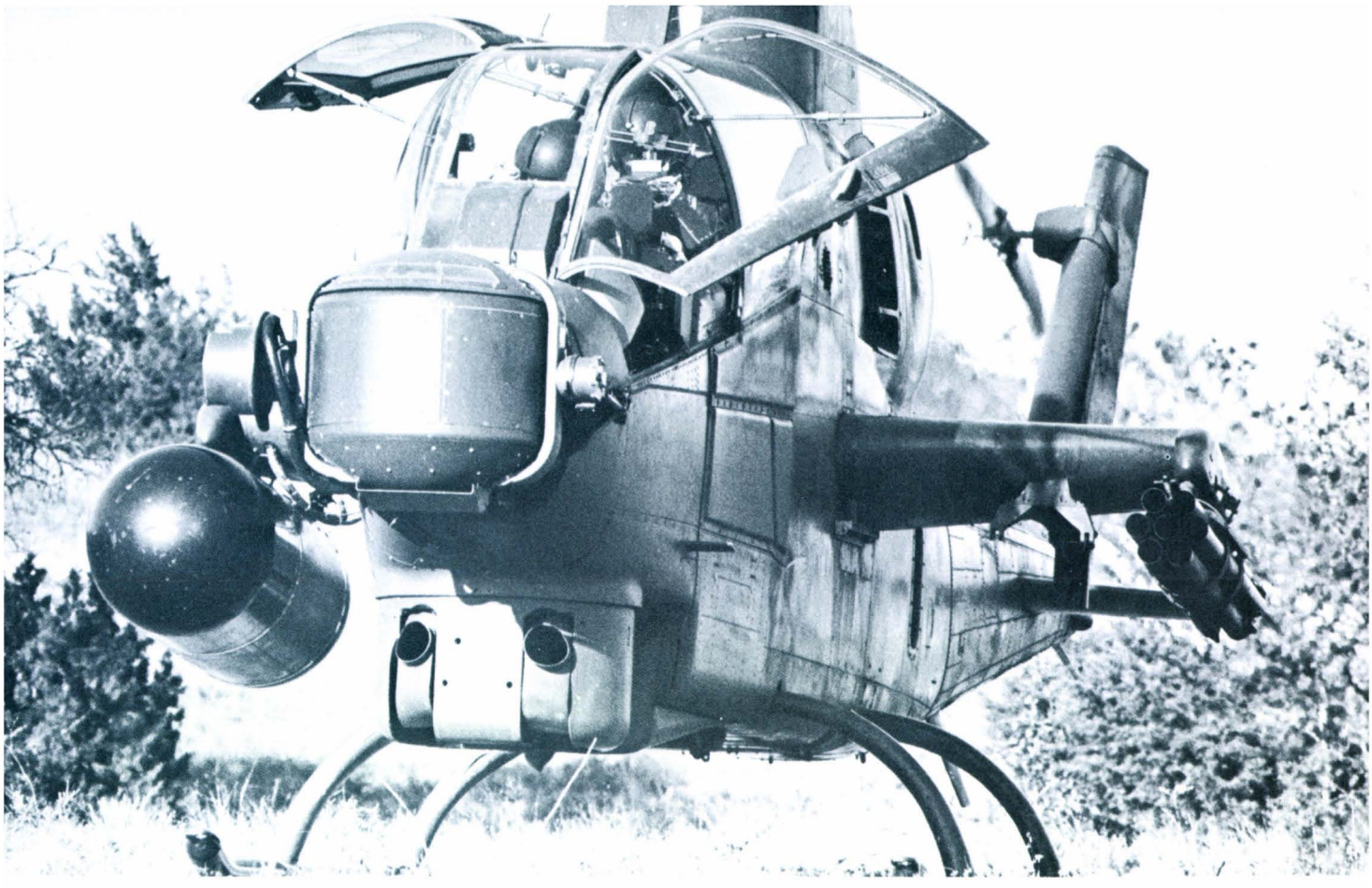
Organizationally, we are assessing our combat lessons and the advances we have made in technology. We are studying new combinations of force such as the Triple Capability Division (TRICAP) at Ft. Hood, TX. And we are testing, over the period of the next several years, a division with an armored brigade, an airmobile brigade and an air cavalry combat brigade. The latter brigade could well be a separate organization. It is the last of the major new organizations recommended by the Howze Board in 1963. Because there were insufficient people and aircraft to test it while the 11th Air Assault Division/1st Cavalry Division was being evaluated, its testing was postponed.

Tactically, we find that the requirements of an European non-nuclear type battlefield will be substantially different than the low intensity of Vietnam. We expect that potential enemies will be equipped with heavier weapons which may well be radar directed and armed with seeker heads. Our thinking and our techniques are subject to great change. Our gunships that could cover light observation scout helicopters from above, as was done in Vietnam, must learn to operate in a nap-of-the-earth mode. The location of the commander in a scout/gunship team probably will shift from the gunship or special command and control aircraft to the LOH. The scout will have a greater understanding of the battlefield than its covering gunships.

While we were able to get along with a tactical instrument card and a minimum instrument capability during the war, the requirements of an European battlefield will be for a full instrument capability by all aviators.

Such changes in our organizations and tactics will require that we re-think our whole way of doing business. We can clearly see the need for (1) the development of fresh tactics; (2) a concentration on proficiency; and (3) the enhancement of effectiveness as we work with other members of the ground team.

Note that I have avoided the



use of the word "professionalism." We are professional and have been professional since the beginning. Our dedication to duty is beyond question. What we need to do is increase our qualifications.

Accordingly, early this year the Department of the Army will establish a series of goals which we must strive to meet. The first goal is that every aviator must attain a standard instrument ticket by the end of this year. In a parallel action the Army will undertake to make all of its tactical helicopters instrument qualified. This will require instrumentation, navigation equipment and, on certain aircraft, the addition of a second generator.

By the end of FY 73 the only tactical fixed wing aircraft remaining in the active Army and Reserve Components will be the OV-1 Mohawk and the U-8/U-21 command aircraft. Rotary wing aircraft will account for over 90 percent of the inventory. This means that in the past decade we have moved from a fixed wing to a helicopter fleet. As time goes on and technology continues to favor us, the proportion could well increase. Therefore, a goal will be established that every aviator be rotary wing qualified by the end of FY 75. Preliminary planning is that "fixed wing only" aviators will be cross qualified in helicopters during normal changes of station or as they are required to fly rotary wing aircraft. Individuals qualified in both rotary and fixed wing aircraft should be instrument qualified in the aircraft they are expected to fly for proficiency.

An additional goal is that all aviators not excused from, or prohibited from, flying will attain a full 80 hours of proficiency flight each year. Units will be expected to subdivide this time and to supervise the proficiency flying so that individuals possess a night and day and adverse weather (VFR) capability. A low level nap-of-the-earth capability utilizing pilotage navigation must be possessed by all.

While the Department of the Army can set goals and prescribe subsidiary requirements, it remains for the individual commander and aviator to understand the goals and to implement them in a positive fashion. If the individual does not have in his heart the desire to be highly qualified, he will detract from the Army's total effort. What the aviator did in the last war will not fully qualify him for the next war. Rather, our efforts must be channeled in the direction of the overall Army training goal: To achieve a degree of individual and unit proficiency which exploits the full tactical potential of Army aircraft and equipment. If you have any piece of the aviation action, this is your challenge.

From Plan To Reality

Army Aviation Reserve

In ever-increasing numbers Army aviation personnel leaving active duty are discovering they can continue their careers in an expanded Army Reserve aviation program. And for some that program also means civilian employment

Major General J. Milnor Roberts
Chief, Army Reserve

DURING THE PAST year a lot has happened to Army Reserve aviation. The promises of 1970 became the reality of 1971. Where before the Army Reserve aviation program had to limp along with obsolete aircraft, and with few of them, today the odds are that no matter what kind of bird you flew or maintained on active duty you'll find the same kind of bird in the Army Reserve inventory.

And where the aviation program existed almost on a minimal qualification level, today's Army Reserve aviators are engaged in a robust flying program, fully supported and augmented by extra paid flying periods. Additional fulltime flying and maintenance positions have been authorized at Army Reserve aviation facilities to support their higher level of activity.

During the past year much has been written (see AVIATION DIGEST, July 1971) about these aggressive and far-reaching plans to expand and modernize Army aviation within the Army Reserve. The purpose of this article is to give you a progress report on how these plans have become or are becoming reality, and how you can be a part of the reality of Army Reserve aviation.

As part of the Army's policy of placing increased reliance upon its Reserve Components in the advent of war and for meeting its peacetime obligations, the Army Reserve has been restructured to contain the specific number and type units, including aviation, necessary to support the Army's contingency and mobilization plans. Not only has there been some changes in types of aviation units, but also units in the Army Reserve have been converted to the current tables of organization and equipment (TOE) in effect for the active Army. So today, no matter whether an assault support helicopter company is organized in the active Army or the Army Reserve, it contains 16 CH-47 Chinooks and one UH-1 Huey.

The days of the O-1 Bird Dog, OH-23 Raven and other such creatures are gone. It is a reality that Army Reserve units are receiving UH-1s, OH-58s and CH-47s at an accelerated rate. And it is good equipment, too; many of the aircraft are brand new, direct from the manufacturers, or come to us direct from depot overhaul.

Units are no longer faced with having to make do with just a few of their authorized aircraft. They are being filled with aircraft to their full authorization. Programed deliveries of aircraft during the coming year will nearly double the number of aircraft we had onhand in the fall of 1971. As in the active Army, most of our aircraft are choppers; however, we will have some fixed wing.

The very nature of the Army Reserve is "geographical" with 3,500 units located throughout the nation in some 1,019 Army Reserve training centers. We try to locate our aviation facilities where the people are. Thus, many units are in major metropolitan areas, usually far removed from active Army

Continued on page 32

The Department of the Army is presently taking action to assist units in resolving some of the problems identified in this article. For explanation of some of the actions being taken see LTC Jones' article "National Guard Aviation Prepares for Readiness Role" on page 18. Also readers should be aware that a sample aviation accident prevention program may be obtained by writing to: Commanding Officer, U. S. Army Agency for Aviation Safety, ATTN: E&P, Ft. Rucker, AL 36360

Army Aviation In The National Guard

A Management Challenge

The Reserve Components have generally lived with a "static" Army aviation program since 1965. They now find that they are to play a bigger and much more meaningful role (in terms of readiness) in the total Army aviation mission. This new responsibility presents a great variety of problems to the Army National Guard and one which will require the best in expertise the Guard can muster. It is a refreshing and welcomed change. It is a sobering challenge

Brigadier General James S. Brooks
Chief of Staff, Idaho Army National Guard

IN DISCUSSING THE recent growth of Army aviation with some of my colleagues, I find that they are having the same growing pains that we in Idaho have recognized. As the active Army is reduced in size and the Reserve Components take on greater responsibility, it seems to me that there is no single area of our concern which demands more attention than Army aviation. The following comments, while based on the Army aviation program in Idaho, are typical I feel of the problems which the Guard faces. They are, therefore, submitted as being of possible interest to all readers. I am sure there are others who have a broader view of the total program than I; however, there is no one who is more concerned about the future of Army aviation in the Guard.

From 1965 to 1970 there was not one new name added to the roster of aviators. During this same period there was not one new aircraft added to the 14 "1st generation" observation aircraft (OH-13E, OH-23 and O-1A) and the queen of the fleet—one U-6, 1954, with radios. On 1 January 1970 there were 23 aviators assigned. While a bit bored they loved their jobs, they worked hard and the six mechanics, one parts specialist and one flight instructor—all things to all aviators—could just about do their jobs without actually being present for duty.

I well remember a question that came up during the 1967 annual writ for aviators. About 15 minutes after the 4-hour session started, one of the aviators asked the aviation advisor (administering the test), "Question 14 refers to a UH-1, what's that?" That same year our repair parts budget for aircraft amounted to $12,648.

From the mission standpoint we really had it made. During the winter months the weather was marginal enough to preclude any serious commitments (few people were really instrument rated anyway). In the summertime the density altitude was between 4,000 and 6,000 feet, so many missions were rejected as beyond the capability of the OH-13. It really was kind of easy to manage the program. The total flying hours program for that year, and others to follow, was 2,600 hours. One year we spent almost $7,000 for POL and the comptroller raised Cain with everyone, as we had only budgeted $6,265. That same year our one flight instructor took off for 9 weeks to attend a special

instrument course at the U. S. Army Aviation School at Ft. Rucker, AL, and no one missed him.

From September 1965 through July 1969 there was not even one quota to Ft. Rucker or Ft. Wolters, TX, for primary flight training. No other Guard or Reserve unit got quotas either, as the Army had its hands full meeting its terrific requirements for Southeast Asia.

Through the lean years of the late 1960s the Reserve aviators did their best to maintain individual proficiency in the aircraft available. There never really was a meaningful capability for unit training. At our annual aviation safety conferences—yes, only one a year—we were hard pressed to "spark" real participation. One crew chief asked if he would be given any special consideration on his MOS test as he had never seen a turbine engine and the only knowledge he had of torque was what he read on the dial of a 14 inch wrench.

The aviators were so far removed from what was really going on in Army aviation that they wondered if the Army would ever need a real "hot pilot" in a 1951 model helicopter that had to have the ballast weight moved fore or aft depending on the weight of the passenger.

Had it not been for the loyal and eager people involved, who somehow or other were willing to understand and "plug on," there would not have been an Army aviation program in the Guard. Thanks to the cooperation of the U. S. Aviation School, U. S. Army Agency for Aviation Safety (formerly USABAAR), the Director of Army Aviation, the Department of the Army and the Chief, National Guard Bureau, we were at least able to keep a program going during those lean years. While my description of conditions might suggest that the whole program was a waste of time, it wasn't. That thin line of continuity has proven invaluable as we set about building a "really big show."

At the annual budget formulation session of our Army Guard staff we went through the routine procedure. It was April 1970 and we were working on the FY 71 budget requirements. After a 20-minute presentation of the command guidance, each principal member of the staff was asked to give a preliminary comment on the FY 71 requirements as he saw them:

The director of operations and training said a 10 percent increase in funds would take care of the school requirements.

The director of personnel said he would not need a fulltime recruiting officer to maintain strength because of the selective service pressures.

The director of supply said normal increases to account for inflation would do.

The director of maintenance (DM) said that our old equipment was wearing out and that a 20 percent increase in repair parts funding and some additional maintenance personnel would be justified. Then speaking as the *aviation officer* (an additional duty) the DM said, "In the aviation program I need a 300 percent increase in everything."

The comptroller laughed.

Little did we know or appreciate that the DM's statement was very much on the conservative side. Of course, a 300 percent increase was not programed, but by the middle of the year it was evident that regardless of the ridiculous sound of such an increase, it was more than justified.

When April 1971 came along and the aviation officer was again asked for estimates he said, "I need a 300 percent increase in all areas for 1972 and you need a fulltime aviation officer."

This time there were no laughs. It has become clear that management was already a step behind the growing aviation program.

In retrospect, we must admit that we had had several official indicators that aviation in the Army Guard was to grow—and very fast. On the first day of July 1971 an analysis revealed that we had already had a 150 percent increase in aviators in 18

SP5 Charles Matthews checks OH-58 avionics at Jacksonville, FL

months. We had received in an "as is" condition 8 CH-34 helicopters and 9 OH-23Ds as replacements for the OH-13s. (The first CH-34 periodic inspection we performed took 1,050 manhours.)

We had 25 new aviators direct from active duty who had never flown anything except a turbine-powered helicopter. We didn't have a mechanic who had ever worked on a UH-1 and the first D model Huey which was scheduled to arrive in August actually arrived 4 months early.

The basic load of tool sets for the UH-1 was to cost twice our budget for tools for the entire year. Our maintenance hangar—built with all the vision of an ant—wouldn't even accommodate 10 percent of the aircraft for which we had mechanics. If it hadn't been for our friends in the Air Guard, we wouldn't have had enough jet fuel to support a weekend flying session.

A quick look at our "qualified" instructor pilots (IPs), standardization and transition programs, and instrument examiners revealed another "dollar short and day late" situation. From July through November—just 5 months of 1971—we were given a complete aircraft replacement schedule. From 24 obsolete aircraft of five different types and models, we were programed to go to 48 UH-1 and OH-58 helicopters in a 1-year period. From a support force of 17 (16 mechanics and 1 ground support man) the program has always been a year behind until FY 72—we went to 33 in 5 months with 48 scheduled by 1 July 1972.

An FY 70 repair parts budget of $46,708 had gone to $180,000 in fiscal 72. The maintenance shop space will be tripled in 1972 and we now have 4 flight instructors authorized for the 65 aviators onboard. Just recently the distribution of gun kits was announced and no one has had time to think about a gunnery SOP, let alone a training program. To cope with the expansion the principal military unit involved has been doubled in size. This requires a very aggressive recruiting effort (this time without much help from selective service) and a very specialized training program.

Truly, the Guard is going from famine to feast in aviation. The real challenge is to management. For the first time in my 24 years with the Guard, we are getting the funding support required, including the money to buy special tools for the new aircraft. Qualified aviators, ground support personnel and technicians are generally available as many are being released from active duty with the Army.

But what about management? Do we have the talent to resolve the maintenance versus operations conflicts that always exist in aviation? Do we have the talent to budget and program the hundreds of thousands of dollars required for the flying hour program (9,000 hours in FY 73), for parts, tools, facilities, POL and technicians? Do we have the talent to organize what has generally been a "weekend" flying program into a 4, or 5, or even a 7-day-a-week program? Do we have the talent to determine what facilities are required to support our aircraft operations, maintenance and training requirements? Who is an expert in gunnery? Who can maintain the gun kits? Who will write a new and meaningful SOP for safety? How do we get aviators transitioned to new aircraft? How many IPs and instrument examiners do we need? How many mechanics need to be retrained? Can we get the money to train them (the Guard has to "pay" for all school training) and can we get the school quotas? And most important of all, are we able to solve these problems and do our job without becoming a USAAAVS accident statistic? This is the real challenge.

While these questions and their implications are food for serious thought, I feel that our chances of solving them—safely—are very good indeed. The "one Army" principle, so deliberately developed over recent years, gives us in the Guard access to all the expertise of the active Army if we are just alert enough to ask for it. Our own system has produced some of the most stable and qualified managers in their fields. Now is the time to work them overtime if necessary. Yes, the challenges are great. The stakes are high but the morale and will are also high. There is no reason why we in the Guard cannot produce a strong and meaningful aviation program. But to do it we must concentrate on first things first. Some who fly may find themselves spending more time than they like solving problems on the ground, but it must be done if we are to produce the results that are expected of us.

For those who are managers it is time to get our heads out of the cockpit and into the problems. A proficient pilot is not necessarily a proficient manager, and while we need both it is time that the requirements of coordination, planning, budgeting and decision-making take precedence over the more enjoyable task of flying. For the Guard aviators who have been charged with the responsibility, it's time to manage now—fly later.

Updating The Flight Excusal Program

Colonel William R. Ponder

The Department of Defense has studied a revised proficiency flying program. It is anticipated that the new program will be implemented this month

HOW MANY AVIATORS do you know who are leaving the Army next year? How many are in designated flying assignments and are required to meet the 80 hours minimum flying time even though there is no actual requirement for them to fly?

A new look should be taken at the Army's flight excusal program due to early-outs, the reduction in force (RIF) and passover policies. Expansion of the current flight excusal program should be considered due to austere funds, old aircraft and increased emphasis on force readiness. Basic objectives of this program should be to conserve resources, improve training and identify (early) aviators who have demonstrated the required professionalism to join Reserve Components upon completion of active duty.

The basic point is, Why train and require expenditures of money, aircraft and personnel on known losses from Army and Reserve Components? The solution may be excusal of aviators with known release dates from meeting flying minimums. An exception may be to require Army aviators who do not have 15 years rated service to fly 4 hours per month for pay. In addition, aviators with 15 years rated service, with a known release date, shall be excused from all flying requirements if not actually assigned to flying duties.

Many Army aviators have elected to return to civilian life upon completion of current tours. It appears that certain others have been or will be notified of their second passover or mandatory retirement date. In addition, other personnel actions will require release of many aviators from active duty. It appears that the Department of the Army (DA) could give an installation commander the authority to waive all annual flight minimums when an aviator not directly involved in flying duties is notified of his release from active duty.

Many aviators in staff positions have 15 years flying experience and are excused from flying for pay purposes but are still required to meet flight minimums (AR 95-1). At the same time there are many aviators assigned to aviation military occupational specialties (MOSs) performing other duties. For example, a warrant officer assigned to a table(s) of organization and equipment (TOE) cavalry squadron is assigned an MOS of flying duties; however, he actually performs theater officer or game warden duties. He is getting out of the service within 6 months after arriving at his new duty station, but he must still meet the annual flying minimums. This is the type situation in

which many aviators leaving the service find themselves. Aviation units and individual aviators will be better trained if these aviators are excused from flying and those aviators who remain on active duty receive more and better training.

There is another loss to the Army when considering the overall requirements of the current flying program viewed under the combat-readiness flying program and aircraft available for aviators to fly. The majority of aviators are rotary wing qualified; therefore, let's look at a typical flying day of Captain "M" obtaining his 4 hours in an OH-13. Due to safety requirements and fuel available, both in the aircraft and at a military airfield, most OH-13 flights are of 2-hour duration. This means that Captain "M" is away from his office duties 6 hours to obtain 4 hours flight time. Captain "M" is returning to civilian life in about 8 months, but he is still required to meet the annual flying requirement (80 hours) to maintain his instrument rating. Is the expenditure of these scarce resources—meeting annual flight requirements—worth the cost for known losses to the Army? Is there a better way to improve training for aviators remaining in the Army at less cost?

There is always the problem of "What if?" A big "What if?" in the expanded flight excusal program may be the impact on Reserve Components. It would appear that Reserve Components should be trying to obtain the younger aviators of lower grades—not those with over 20 years active duty, the two-time passovers nor others eliminated by DA board action.

One method of improving aviation training, reducing the flying hour program and possibly identifying (early) those aviators that have demonstrated the required professionalism to join Reserve Components is to:

- Authorize the installation commander the right to waive all minimums and instrument renewal for aviators who meet the following requirements: (a) aviator(s) not directly involved in flying duties be excused from flying minimums upon notification of his release from active duty (except 4 hours per month for pay for aviators with less than 15 years flying time, if required by law); and (b) aviators with more than 15 years rated service be totally excused from flying, if not directly involved in flying duties.
- Authorize the installation commander the right to allow aviators with release dates to meet annual minimum requirements if they sign a statement of intent to join Reserve Components upon release from active duty.
- Authorize the installation commander the right to discontinue flying for those aviators with known release dates if they have not demonstrated the required professionalism.

The statement of intent of aviators to join the Reserve Components and letters of refusal of aviators disallowed to continue flying can be sent through the Office of Personnel Operations (OPO) to Reserve Components headquarters. This action can assist Reserve Components in obtaining qualified aviators.

Now is the time to review, update and streamline the flight excusal program to align it with the early-out, RIF and retirement programs.

INSTRUMENT CORNER

Q. I've noticed that in the new issue of FLIP, Section II, (6 Jan 72) under "Additional Reports" on page II-72 that reporting out of an assigned altitude, when cleared for an approach, is now required. I think this is great! However, it proves to be one more point of controversy between what is required by FLIP, Section II, and the Airman's Information Manual, Part I.

In particular the Airman's Information Manual, Part I, requires "the time" when reporting leaving a holding fix or when leaving a final approach fix inbound on final approach. FLIP, Section II, does not require the time. What is actually required and what should be included in these two reports?

A. These two publications were in agreement until the words "the time" appeared in the May 1970 issue of the Airman's Information Manual, Part I. Apparently these differences have caused much controversy. A meeting was held on 30 November 1971 at the Federal Aviation Administration headquarters with members of all services present to discuss this particular problem. An agreement was reached and the February 1972 issue of the Airman's Information Manual, Part I, will have the words "the time" deleted. Therefore, unless the controller specifically asks for more information the only requirement is to report the fact that you are leaving these fixes. Reporting out of an assigned altitude when cleared for an approach is also being considered for inclusion in the Airman's Information Manual, Part I.
Reference: USAASO

Germany Tests Airborne TOW

Hughie J. McInnish Jr.

Mr. McInnish, a DAC, is TOW (Tube launched, Optically tracked, Wire guided) missile project officer at Redstone Arsenal, AL. During the German tests he was the U. S. representative on site at Bückeburg, Germany. The author also headed the American support team comprised of personnel from Bell Helicopter Co. and Hughes Aircraft Co.

SPRING CAME slowly last year to northern Germany. When our four-man American support team arrived at Bückeberg in early March, we were assured by the natives that the cold winds and snow we were experiencing were "the last blast of winter." From the Army Missile Command, Hughes Aircraft Company and Bell Helicopter Company, we had come to help the German Army Aviation School in its evaluation of the suitability of the TOW missile for use in an airborne role. Being from Alabama, California and Texas, we were eager to believe the weather assessment.

TOW (Tube launched, Optically tracked, Wire guided) is a 50-pound antitank missile which has recently been deployed with U. S. infantry forces. In 1967 five prototype airborne launching systems were built for testing on the UH-1B. These systems called XM-26 used three of the same missiles developed for the infantry, mounted in each of two launch pods on either side of the helicopter. The left nose of the ship was modified to accommodate an inertially stabilized telescope sight which was operated by the copilot/gunner in the left

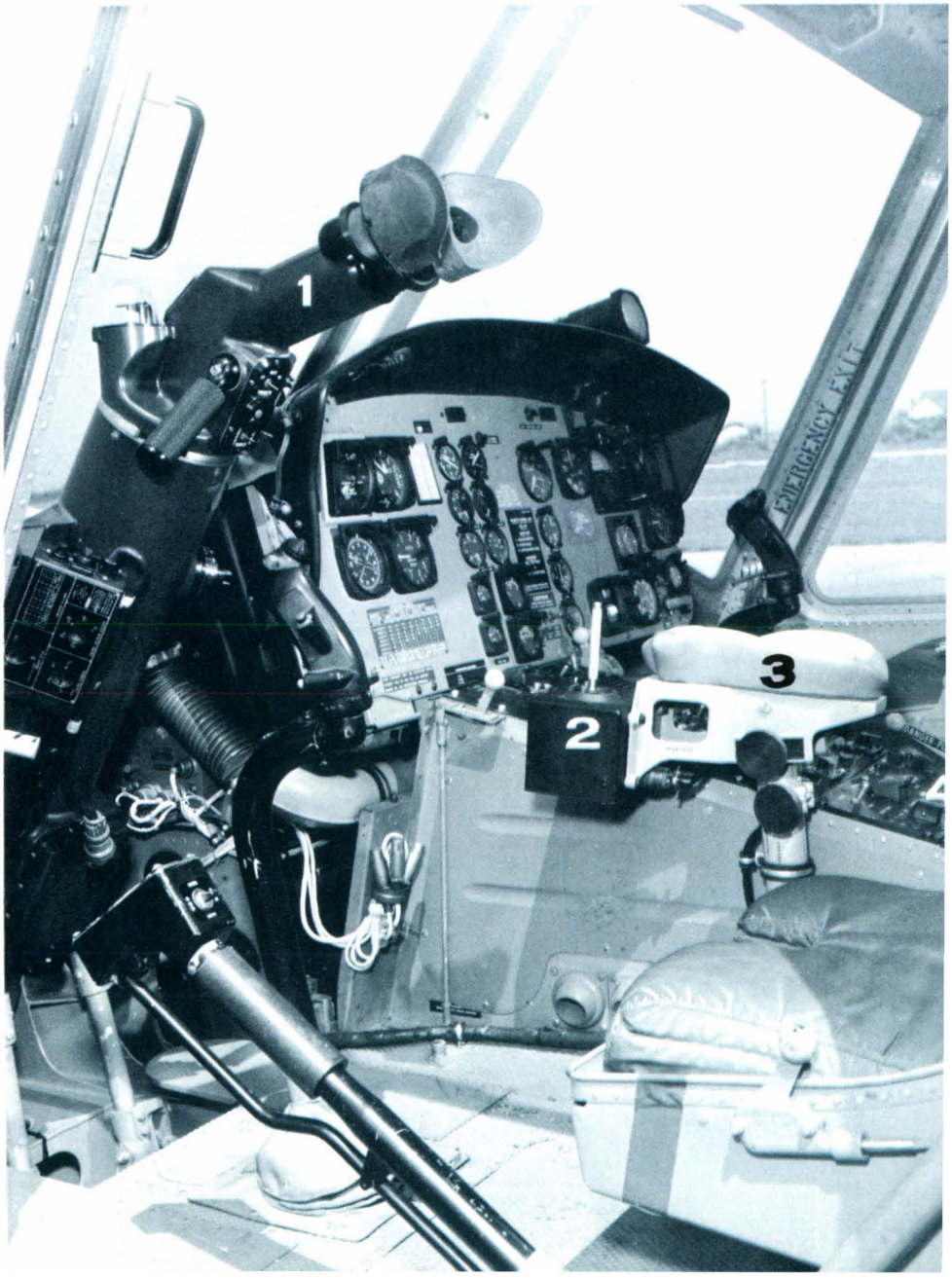
seat. With these systems the gunner acquires the target in his sight and fires the missile. The missile then flies into the field of view of the sight, which senses the position of the missile, and is automatically guided down the line of sight to the target. The gunner positions and holds the cross hairs of his sight on the target and the missile hits whatever he is aiming at.

Although these prototypes had undergone considerable engineering testing, they were never given to the Army for service tests since the main developmental effort was shifted to the more advanced AH-56 Cheyenne weapons system. The Germans then were to be the first military people to test the XM-26.

As we unloaded the U. S. Air Force C-141 which had transported the UH-1B and some 7 tons of support equipment from California, we were informed that the base of operations for the first phase of the test would be moved *north* to Itzehoe, 30 miles northwest of Hamburg, with the firing missions being flown against targets at the Meldorf range located on the North Sea.

But first the helicopter had to be reassembled, the electronic equipment checked and the crews trained. The reassembly and checkout went smoothly, but winter's last blast presented a severe challenge to crew training. Contending with high winds, rain and snow it was difficult to achieve the required proficiency in the time available. Using a target with an infrared source mounted at the center, together with measuring and scoring equipment on the helicopter, it was possible to measure a gunner's proficiency and progress. In spite of the bad weather which resulted in the postponement of the first scheduled firings, the Germans got the first two shots off 3 weeks after our arrival. The purpose of these two shots was to confirm that the system was functioning normally and this they did.

With this milestone behind us, we proceeded to Itzehoe and prepared for the firings to be conducted at the Meldorf range. Because of the shortage of real estate for test ranges in Europe, the Meldorf range utilizes tidal flats extending into the North Sea. These tidal flats are similar to the areas later reclaimed from the sea in Holland and are, together with the targets, underwater at high tide. The dry end of



UH-1B cockpit modification for TOW include:
(1) sight unit stabilized telescope
(2) Sight unit hand control
(3) Arm rest, unit hand control
(4) Control armament - TOW

the range is shared with the hundreds of sheep which graze the forward rim of the dike.

Unfortunately though at this moment the last surge of winter was moving across the North Sea area. For the first week our sole occupation was waiting—waiting for the weather to improve enough to see the target. Occasionally the weather would improve enough for a few hours to shoot, but invariably that would be when the tide was high and the target was underwater. But bad luck never lasts forever and finally, though the weather was still marginal, we could at least see the target. At Meldorf we fired 15 missiles, not in the planned 2 weeks but in 3 days.

With the conclusion of this first phase of the firings the operations returned to Bückeburg, and the nearby ranges at Bergen Hohne and Munster Lager. The firings at Meldorf were conducted under the auspices of the Ministry of Defense test agency, but the responsibility now shifted to the German Army.

Based at the Heeresfliegerwaffenschule (Army Aviation School), the Ft. Rucker of Germany, the tests were under the leadership of Lieutenant Colonel Bender, the project officer. LTC Bender is an erstwhile Stuka pilot (more than 500 missions on the eastern front) and had a penchant for early operations. Typically our team would arise at 0430 and report to the airfield at 0600 for a 0615 takeoff (assuming no more than moderate rain, sleet or snow) for the range. The ranges were shared with tankers doing their practice firings and with other weapons firings. Because of the heavy use, the scheduling was tight and we seemed to consistently draw the early slot.

During the Army portion of the tests a total of 40 missiles were fired and they were usually interesting to observe. The tests conducted in the U. S. had shown that the XM-26 was an extremely accurate and effective weapon system when employed in a conventional manner. The Germans, however, were not content to test merely the known capabilities of the system, but soon made known their intentions to push forward the state-of-the-art in tactical employment as well.

The XM-26 has always been considered a broad daylight system but the Germans tested it at sunset and well after. One of their favorite tests was to require the gunner to fire the missile toward a certain target and, after the missile was on its way, "change his mind" and shift to a new target. This is particularly challenging when the new target is outside the field of view of the original target and the gunner must hunt for and find it before the missile reaches the target. For members of the U. S. team, accustomed as we were to a more conservative test philosophy prevalent at home, such test conditions were decidedly hair-raising.

But the Germans showed that

Test helicopter for TOW . . . a three missile capacity pad on either side . . . note the telescope protruding from the left nose of the ship—the copilot's side

Evidence of the final day . . . live warheads used against tank hulks positioned on the range . . . qualitative summary . . . if the crew can see the target they can usually destroy it

it could be done. With air speeds from zero to cruise, at altitudes from near the ground to well out-of-ground effect, and in conjunction with a variety of post-launch evasive maneuvers, they consistently hit both fixed and moving targets from minimum to maximum range. As a concise qualitative summary of the German tests it can be said that if the crew can see the target they can generally be expected to destroy it.

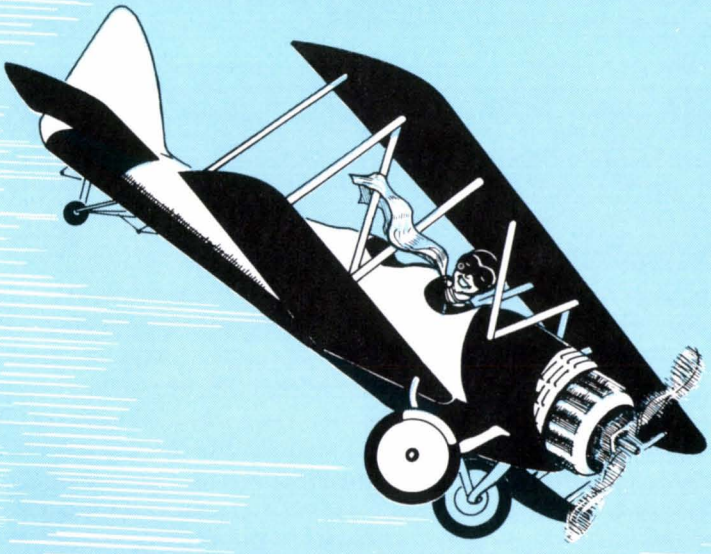
Apart from the technical success of the tests, the American team found the project highly educational. Most Americans on duty in Germany are stationed within a small American community, but not so with us. We were set down square in the midst of the natives. In such circumstances a usually simple matter such as placing a long-distance phone call becomes a frightening experience. Learning the German words for the numbers was a high-priority task in order to overcome this obstacle.

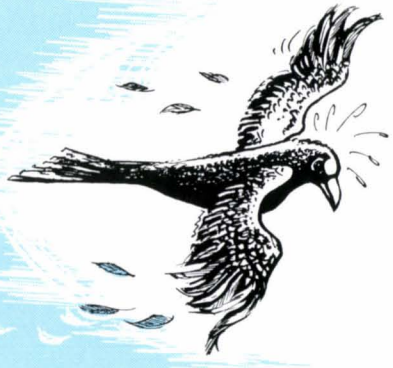
Another small task usually considered mundane by us, but which proved to be somewhat more ceremonious in Bückeburg, involved reproduction of data. In the habit of sending the girl downstairs to the Xerox machine to get the needed copies, we handed over a sheaf of papers to our German colleagues with a request that we be provided copies. Two days later two men in long, white coats appeared and with characteristic great courtesy submitted the proofs for our inspection. We selected those which seemed best and we were shortly given our copies—in very high quality.

Most of the missiles used in our program had dummy warheads, but for the final day VIPs and visitors from several countries were onhand to observe the firing of six missiles with live warheads which had been saved for the occasion. These were fired from various ranges and flight conditions against actual tank hulks positioned on the range. With their fireball finale at the end of each missile's flight, they made an impressive climax to a very successful program and provided an effective demonstration of the potency of airborne TOW.

When the last shot had been fired on that day in late May we mounted our helicopters and flew back to home base at Bückeburg for the last time. As we walked from the ramp to the hangar we had to hurry. A chill wind was stirring and on the horizon we could see, moving toward the field, "the last blast of winter."

Aeromedic





The life support equipment retrieval program is mainly the responsibility of the flight surgeon. However, all air crewmen should be familiar with its purpose and procedures. This is especially so for officers who may participate in aircraft accident investigations and for others involved in the postaccident handling or disposition of life support equipment

The Life Support Equipment Retrieval Program

LTC Donald F. Miller LTC John D. Albright MAJ Thomas D. Casey

The first flight surgeon's report written by the first Army flight surgeon, CPT Robert J. Hunter, dated 31 May 1918 read as follows: "Investigated the three accidents occurring since I came here. None of these was fatal. One was due to inexperience, topography of the country and mechanical difficulties. Second: Uncertain cause but patient thinks he hit his head on the cowl while doing a loop. Third: Machine out of control while chasing a crow."

Provided by the Society of U. S. Army Flight Surgeons

SOUNDS PAINFULLY familiar doesn't it? Fifty years of sophisticated aerospace technology haven't changed things as much as we would like to believe. The lack of an adequate flight helmet which apparently caused the second accident, in which it is believed Lieutenant "Hap" Arnold was the pilot, demonstrates that personal protective equipment or "life support equipment" has been an integral part of the problems of Army air crewmen from the beginning. (As a matter of fact, we continue to observe an occasional accident resulting from chasing "crows"—or water buffalo—or Hondas—but that's part of another story.)

During the early decades of aviation, life support equipment was generally improvised from the infantryman's standard gear or from sports equipment such as football helmets. In fact, prior to 1941 only about 7,000 military aviators had been trained since the invention of the airplane and no organized life support equipment effort had been made. During World War II, out of necessity, intensive efforts were made to provide adequate life support equipment for the Army Air Corps. As an interesting note in passing, the Luftwaffe issued standard steel helmets for flak protection early in World War II, but soon discontinued this practice when they noted that the heavy helmet caused more deaths due to broken necks during crashes and even hard landings than had head injuries due to hostile fire.

The Army air crewman has generally used equipment designed for his Air Force or Navy counterparts until recently when he received a Nomex flight suit and the SPH-4 protective helmet. However, there remains room for improvement in Army life support equipment.

In FY 71, 719 accidents occurred in Army aviation, resulting in 314 deaths. The U. S. Army Agency for Aviation Safety (USAAAVS) recently completed a study of all accidents during 1965 through FY 69. They found that 93.5 percent of those accidents were survivable as defined by AR 95-5. In spite of the high number of accidents which were survivable, 39.4 percent of all fatalities occurred in the "survivable" accidents.

The U. S. Army Aeromedical Research Laboratory (USAARL) and USAAAVS are concerned with the prevention of death or injury to Army air crewmen. Both organizations are concerned, among other matters, with life support equipment. Such equipment is designed to protect the air crewman from injury and death, and we must continually evaluate the effectiveness of that equipment.

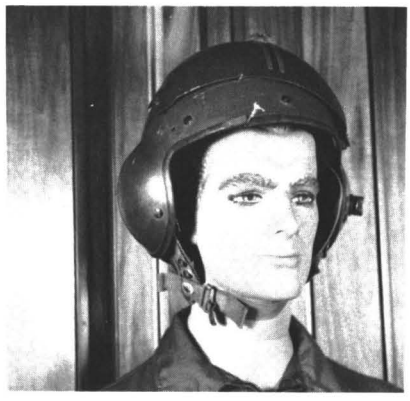
Much research has been done using sensitive instrumentation, animals and human subjects.

It is in an actual aircraft accident, however, that personal protective equipment experiences its "moment of truth." Since accidents will occur in which soldiers will be injured and killed, we believe that the least we owe to the victims of these tragedies is to attempt to learn as much as possible from their unfortunate experiences.

The life support equipment retrieval program is a joint USAARL-USAAAVS program designed to determine through medical, engineering and statistical analysis the strengths and weaknesses of life support equipment and to design improved equipment based on that knowledge.

DA message 250208Z November 1971 sets forth the procedures which accident boards and flight surgeons will follow pending publication of Change 3 to AR 95-5. AR 735-11 defines procedures which supply personnel should use when such equipment is shipped to the USAARL.

We hope that flight surgeons will exercise good judgment in forwarding selected items of survival related equipment. We are concerned with equipment which appears to have prevented a death or injury, equipment which was damaged in an accident, and equipment which failed to prevent a death or injury, even if the equipment itself is not damaged. Such equipment worn by each individual should be labeled to indicate the individual's name, rank, SSAN, location and duties in the aircraft at the time of the crash. Injured passengers' clothing, if of government issue, should also be forwarded with the same information. It would be helpful to place each individual's gear in an individual plastic bag such as "poly-bag, FSN 8105-655-8286" prior to packing for shipment.



Life support equipment has come a very long way since the days of Wilbur Wright and LT Selfridge. The top left photograph shows the aviator's helmet as it was 30 years ago. In comparison, the top right photograph shows an SPH-4 helmet worn by a pilot of the aircraft during the accident depicted in the bottom photograph. The helmet is credited with preventing serious injury by attenuating the crash impulse forces that completely destroyed the helicopter

We at USAARL and USAAAVS are convinced that this program will result in engineering data necessary to improve the protective equipment of the Army air crewman. What we learn from these deaths and injuries should prevent many tragedies in the future. The program will be successful only with the full cooperation of commanders, safety officers, flight surgeons and accident investigation boards. We believe that we will receive that cooperation.

Note for the flight surgeon: Here is the text of the unclassified DA message DAFD-AVS 250208Z November 1971:

Subject: Submission of Life Support Equipment (LSE) for Laboratory Analysis.

1. Pending publication of Change 3 to AR 95-5, the fol-

lowing will be implemented upon receipt of this msg:

A. Life Support and Personal Equipment which is in any way implicated in the cause or prevention of injury and is damaged or partially damaged will be collected and itemized on DD Form 200 or DA Form 444, as prescribed in AR 735-11 dated May 1971. These forms will be used to hold individuals pecuniarily liable or relieve all concerned from accountability. This equipment includes but is not necessarily limited to helmets, flight suits, gloves, boots, oxygen equipment (e.g., masks and hoses), parachutes, and life preservers. Body armor will not be itemized.

B. The flight surgeon will carefully examine the life support equipment belonging to those individuals both crewmembers and passengers involved in the mishap. If any items are involved in injury causation or prevention, all related components should be sent; for example, if a helmet microphone is damaged, the entire assembly might also be damaged. Damage to the outer shell, compressible liner and restraint webbing is not always readily apparent through normal visual inspection.

C. Items being shipped should be individually tagged and annotated as to date and location of the wearer on board the aircraft; i.e., pilot, copilot, crewmember, etc.

D. When an accident investigation is completed, the president of the accident investigation board will arrange for shipment of the equipment for laboratory analysis to Commanding Officer, U. S. Aeromedical Research Laboratory, P. O. Box 577, Fort Rucker, Alabama 36360.

(1) Equipment items sent to USAARL for laboratory analysis will be noted within the report of the accident investigation in Item 11 of DA Form 2397-10, Personal Protective Equipment Restraint Systems and Seats.

(2) DD Form 200 or DA Form 444, as prescribed in AR 735-11, dated May 1971, will be used to hold individuals pecuniarily liable or relieve all concerned from accountability. For problem situations contact USAARL—Autovon 558-3001/5107 or TWX CO, USAARL, Fort Rucker, Alabama 36360.

2. This is a joint project conducted between USAARL and USABAAR [USAAAVS].

The following is an extract from USABAAR's [USAAAVS's] *Flight Surgeons Newsletter*, 1 December 1971:

This message and the pending change to AR 95-5 that it references represent the beginning of a long-planned joint project between USABAAR [USAAAVS] and USAARL.

In this project, we will work together to identify and propose solutions to problems in the life support and personal protective equipment field. Here's how it will work:

(1) USABAAR [USAAAVS] receives the crash facts message immediately after the accident and assigns a case log number to it.

(2) USAARL receives the equipment involved (*identified by name and SSAN* of user/wearer, in addition to the identification required in paragraph 1C of the message). This equipment is then related to the accident case log number.

(3) The equipment is subjected to engineering testing and analysis at USAARL to determine modes of failure, yield strengths, etc.

(4) USABAAR [USAAAVS] receives the results of this analysis, correlates it with the injuries suffered by the user as found in the accident report on DA Form 2397-11 (Medical Information) and stores the data.

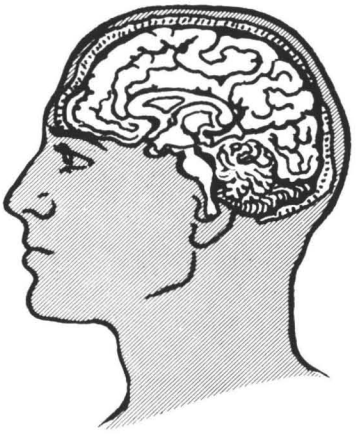
(5) When sufficient information has been gathered, the data will be analyzed and recommendations for improvements to items of Life Support Equipment made.

This analysis and correlation should permit the identification of patterns and trends of injury and failure of protective equipment, which are far more effective in obtaining needed changes than any single case, no matter how illustrative or typical.

Your help is essential. Send the equipment in to USAARL (don't forget the name and SSAN!). Be detailed and specific about equipment failures on the 2397-10, and about injuries on the -11.

Your firsthand observations of what happened to the man and his equipment are vital. Photographs are priceless. Suggestions from you concerning equipment improvement will be welcome at any time.

You Have A Built-in Safety Device



Use It!

National Guard Aviation Prepares For Readiness Role

Lieutenant Colonel Charles R. Jones
Chief, Army Aviation Branch
Organization and Training Division
Director of Army National Guard

DISTRIBUTION of new aircraft to the Guard is meeting published distribution schedules, however, some major changes have resulted subsequent to original plans; full TOE requirements of aircraft are now programed for the Guard instead of full training requirements. This means CH-34 aircraft, previously planned to remain indefinitely in at least five states, will be eliminated from inventories by the end of FY 73.

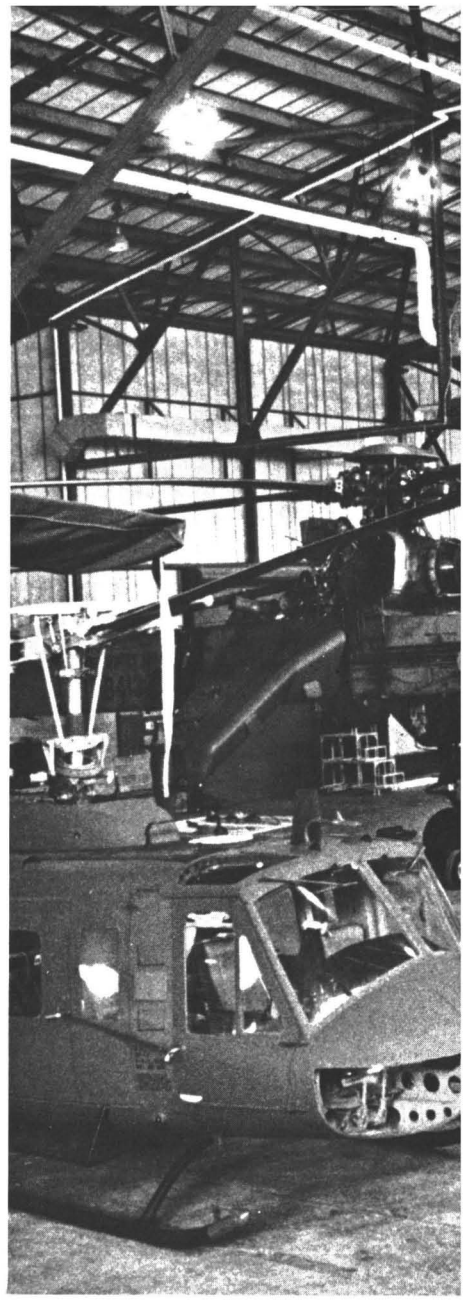
One exception to the receipt of full TOE equipment requirements is the twin-engined aircraft. None are now available, but even this will likely be resolved. OH-6 and OH-58 aircraft are in Guard units; updated distribution plans avoided mixing LOH types in the states, divisions and in armored cavalry regiments.

Another major change was the announcement that aircraft weapons systems would be distributed to the ARNG. Units authorized UH-1C/M armed helicopters and air cavalry troop LOH aircraft will receive appropriate M-5, XM-156 and XM-27 systems. The M-23 (M-60 door gun) subsystem utilized on other UH-1 aircraft will not be issued National Guard units according to current plans.

All states are now involved in a mass exchange of aircraft as they turn in O-1, U-6, OH-23B/C/D and OH-13E/G aircraft and, in turn, pick up newly issued CH-54; CH-47; UH-1B/C/D/H/M; OH-58; OH-6; OV-1; and U-10 TOE aircraft. The inventory at midyear exceeded 1,600 aircraft; full requirements exceed 2,200.

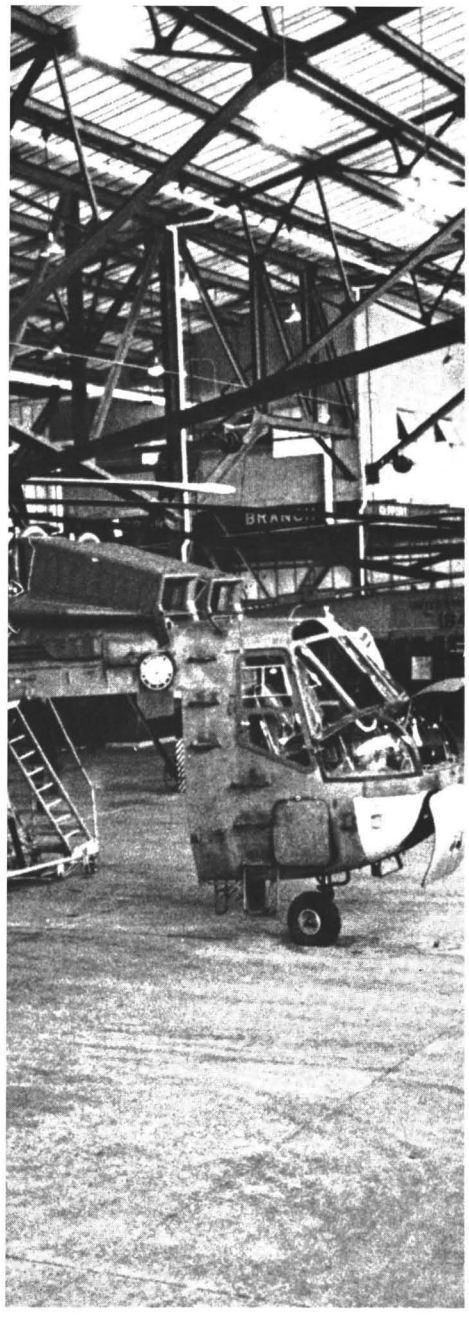
Prior to the present buildup in ARNG aviation there were 1,640 aviators on flying status. Aviator strength now exceeds 3,000. Some states* have filled all aviator spaces while several still have vacancies and are continuing to recruit. Those states having more than 30 aviator vacancies include: Connecticut, Maine, Maryland, Massachusetts, New York, North Carolina, Ohio, Pennsylvania, Virginia and Wisconsin. It is planned to have all 3,900 authorized spaces filled by the end of FY 73.

Fixed wing aircraft will be soon sharply reduced in the Guard except for OV-1 Mohawk units in Georgia, Special Forces units and each state AG TDA; so the word is out to some 200 fixed wing only Guard aviators



The photo above of the Army Aviation Support Facility at Forbes AFB, KN, pictures some of the newer equipment to enter the Army National Guard's inventory. Photograph by SSG Bob Bellinder, Kansas National Guard

*States which have filled aviator spaces: Arizona, Arkansas, California, Colorado, Florida, Indiana, Louisiana, Oregon and South Dakota



to qualify in rotary wing.

As the totals of aircraft in the inventory increase, authorized enlisted flying positions increase. Currently, about 500 enlisted men (EM) are on crewmember or noncrewmember flying status. More than 1,900 flying status spaces will be authorized when full aircraft requirements are met. The publication of EM flying status orders will be measurably accelerated due to a process recently implemented by the director of the Army National Guard. Temporary flying status orders for EM may be issued by the chief of the National Guard Bureau, based on message request when conditions of the service precludes accomplishment of processing the request in time to prevent an undue reduction of unit readiness.

Two personnel actions which will give great assistance to the ARNG aviation program involve approval for flight surgeon section for most state TDAs, and the approval of aviation safety officers at several levels in the Guard.

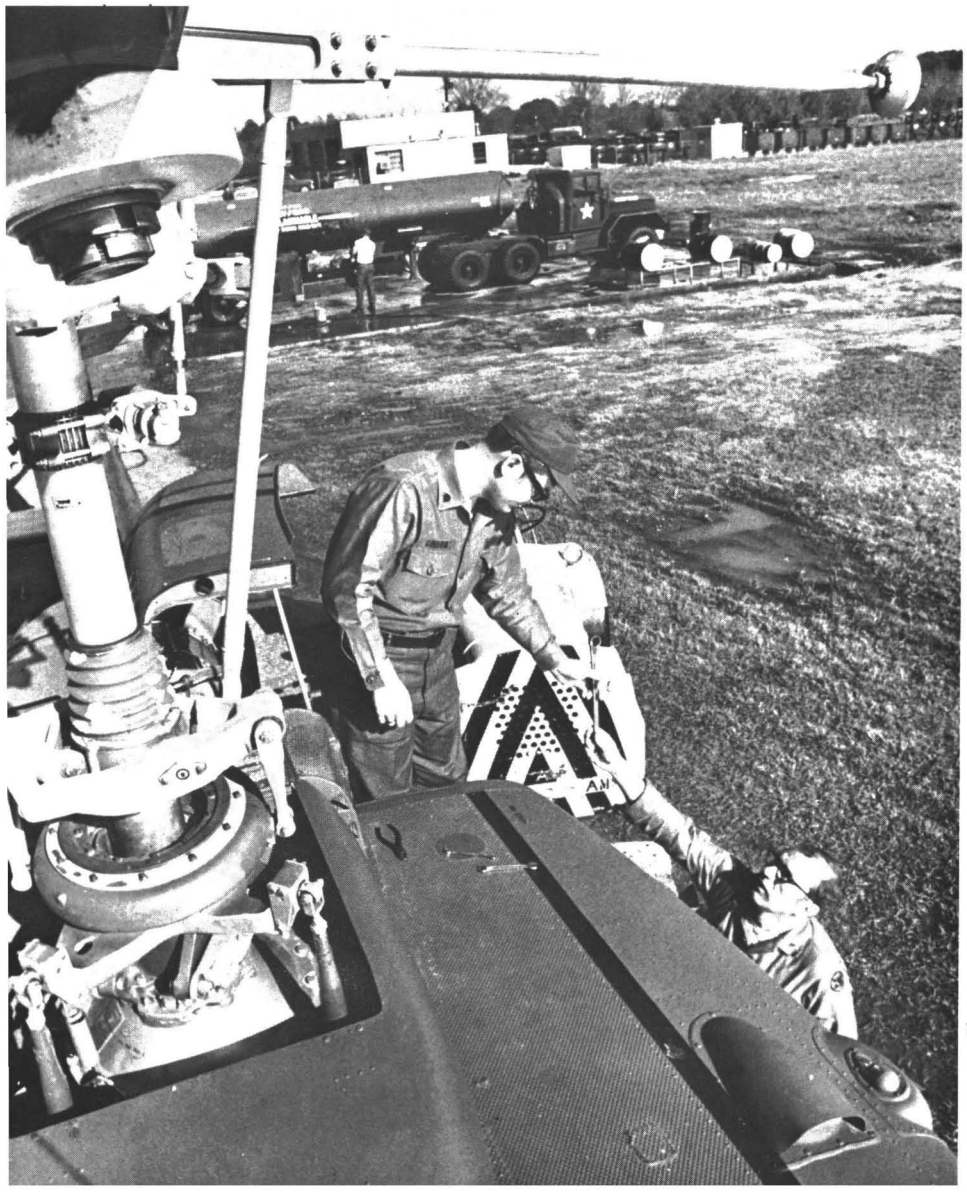
Especially important is establishment of an aviation safety officer position at the National Guard Bureau to oversee the entire ARNG aviation safety program. Additionally, approval has been given for an aviation safety officer on each state TDA and one at each aviation facility. This facility safety officer position results from redesignating one of the standardization instructor pilot positions.

Most states had ramp space available to accommodate expanding aircraft inventories and had hangar space sufficient to meet maintenance work space criteria; however, several did not have the additional required space at their Army aviation support facility (AASF) or flight activity (AAFA). Each state has as a minimum one AASF which is a centralized airfield operated by fulltime Guardsmen-civil service technicians. These technicians, officer and enlisted, provide both supervision of flying training and direct support aircraft maintenance.

The AAFA is an auxiliary field to AASF; it is manned with fewer fulltime personnel and generally does only organizational maintenance. There are currently 63 AASFs and 9 AAFAs in the states, Puerto Rico and District of Columbia. Changes in stationing include approval of AAFA at Spokane, WA; AAFA at Winston-Salem, NC; moving Nevada AASF from Reno to a larger facility at Sted airfield; construction of a new facility at Shelbyville, IN; relocation and construction of a new AASF at McIntire Air Force Base, SC; and relocation of the California facility at Long Beach AASF to Los Alamitos.

The Army National Guard aviation program continues to show excellent progress as it expands and prepares for increased reliance and increased readiness roles. This article updates previously published information on the ARNG aviation program and includes the status of aircraft distribution, personnel, stationing, aircraft maintenance and unit training.

ARNG takes justifiable pride in an aircraft maintenance program which has proven to be unparalleled. Notable additions to the Guard aviation maintenance program were made in July 1971 when approval was received for the ARNG to perform its own general support maintenance at the three existing transportation aircraft repair shops along with approval of the 4th Theater Army Replacement System established at Gulfport, MS. Also, the addition of the Guard aviation logistics center (ALC) will assure quality maintenance as it assists the National Guard Bureau and states in management of the large aviation maintenance program. The ALC is to be located at Davison Army Airfield, Ft. Belvoir, VA, and manned by 14 Guard technicians.



National Guard Aviation Prepares For Readiness Role

Prior to the current Army aviation buildup, the Guard had a small percentage of authorized aircraft and a large percentage of substitute aircraft. A real training challenge was presented as new aircraft systems flowed quickly into the inventories. A massive aircraft qualification program for both aviators and mechanics is still in progress. Formal schools are a must for pilot qualification in CH-54 and CH-47 aircraft; but for OH-58, OH-6 and UH-1 helicopters, pilot training plans call for Guard instructor pilots to be school trained, then to conduct local transition training in each state.

School quotas for instructor pilots have not always matched receipt of aircraft in some states; the U. S. Continental Army Command (CONARC) and Army area commanders have responded to calls for assistance by providing qualified active instructor pilots and ground school instructors and, in some cases, have provided aircraft on an exchange of funds basis.

Experienced former active aviators now in the ARNG have provided the nucleus of qualified personnel in aircraft systems and in gunnery, while unit aviators are undergoing transition training. Aviation mechanic training in the new aircraft systems also is being conducted at

Above left: Georgia National Guardsmen plan a surveillance mission while, below, members of the Alabama National Guard pull routine maintenance on their recently acquired UH-1 Hueys

Photo right: An OH-23B, for many years an integral part of the Army National Guard aviation fleet, will soon be retired from the National Guard. Below: Florida Army National Guardsman checks avionics equipment on a new Florida NG OH-58 Kiowa

formal aviation schools as well as within the unit by using mobile assistance teams and training teams from Army area maintenance sections.

Formal schools take the longest time to produce qualified individuals and the courses include material already familiar to experienced ARNG mechanics. Therefore, Ft. Eustis is tailoring maintenance courses to match the need for pure aircraft system training.

Emphasis on airmobile training is appearing in both aviation and ground unit training; this training was made necessary since aircraft capable of conducting airmobile operations were previously in only a few states. To ensure airmobile training for ground commanders and aviation unit commanders who will be controlling airmobile exercises, CONARC has established a 1-week course which covers the latest airmobile concepts.

Without question the ARNG aviation program is steadily growing and expanding as it absorbs new aircraft systems and melds Vietnam returnee aviators and enlisted men into its ranks. The ARNG response to the tremendous tasks involved in preparing for new readiness roles was given in a recent speech by Major General Francis S. Greenlief, Chief, National Guard Bureau, and a dual qualified Army aviator when he said, "We have a dramatic program in ARNG aviation. It is a challenge. It is a challenge we welcome."

Closed-Circuit Refueling System

Major Frederic H. Stubbs

The author is the project officer in the Office of Assistant Chief of Staff for Force Development for fielding the new closed-circuit refueling system which is now being incorporated into the Army

ARE YOU SICK and tired of aviation fuel dripping or spilling on you from a leaky nozzle or sudden overflow? What about that moment of sheer panic when there is an unexpected surge of fuel pressure that almost knocks the hose out of your hand or the nozzle out of the aircraft fuel receiver? Have you experienced that completely helpless feeling when an aircraft burst into flames because of a refueling accident? Well, help is on the way in the form of a closed-circuit refueling system. It is a relatively simple system composed of two main pieces of hardware: a receiver portion which replaces the present filler neck and cap on the UH-1/AH-1G aircraft and a specially designed nozzle to complete the closed circuit. The closed-circuit nozzle assembly is operable under all environmental conditions.

Experience in the Republic of Vietnam clearly indicates that hot refueling (engines running) will more than likely be the order of the day in any future conflict. This means expeditious refueling in the most forward positions. The constant threat of fires during refueling has always been a matter of grave concern. When you add the inherent dangers of spillage during hot refueling under the pressures of combat you have automatically multiplied these dangers and disasters can be only a few drops away.

The closed-circuit refueling system is a welcomed safety feature; one that is long overdue. We cannot take hot refueling lightly. The record is a bit too grim for complacency. During the period of January 1967 to August 1971, the Army experienced 30 fires associated with hot refueling. These consisted of 13 UH-1Cs, 1 UH-1H, 14 AH-1Gs, 1 CH-47B and 1 OH-13S resulting in 1 fatal injury, 14 serious injuries, 4 minor injuries and a total cost of $2,397,526.

The closed-circuit automatic shutoff capability of the closed-circuit refueling system is a technique to preclude fires during "hot" refueling. The closed-circuit refueling system is designed for fueling under pressure with optimum speed, minimum loss of fuel and a high safety factor. It virtually eliminates spillage, waste, fire hazards, contamination and the toxic effects of jet fuel on fuel handling personnel. There is no weight penalty or loss of useful payload and the cost is minimal for the gains realized.

The receiver becomes a part of the airframe and is compatible with the crashworthy fuel system. Both depot overhauled and new production UH-1/AH-1G aircraft are now incorporating the new receiver unit. Modification work order 55-1500-206-20/3 (Modification to Install Closed-Circuit Spillproof Refueling Receiver for UH-1C/D/H/M, dated 13 August 1971) is now in the field to modify the fueling receptacles on the remainder of the fleet. This is a very simple modification which can be applied by organizational maintenance in about 1 manhour using only one man.

The operation of the system is really quite simple. Nozzle connection is accomplished by a straight push to automatically latch the nozzle to the aircraft receiver. The handle is a two-position (flow "up" and no flow "down") lever which controls the flow of fuel through the nozzle. The nozzle should be connected to the aircraft receiver while the handle is in the no flow (down) position. Once the nozzle has been connected, move the handle to the flow (up) position. Automatic shutoff will occur in the aircraft at completion of fill. The handle should be placed in the no flow (down) position after completion of fill.

The nozzle is disconnected from the receiver by pulling the activating ring lanyard. Emergency disconnect during refueling operations, while the handle

Closed-circuit refueling system

is in a flow position, may be accomplished by pulling the activating ring lanyard and the fuel flow will stop regardless of the handle position. The nozzle may modulate on and off to "top off" tanks where the aircraft uses multiple fuel tanks.

The nozzle assembly must be kept free of ice, snow, mud and dirt which could prevent retraction of the activating ring. This is easily accomplished by the dust plug. The dust plug should be replaced after each refueling in order to keep contaminates from entering the fuel system.

At the time of this writing the nozzle is to be used only with jet fuel (JP-4). It has been determined that MOGAS has a deteriorating effect on the bonding material used on the seal in the nozzle; however, the concept is good and the system is completely reliable when used with jet fuels. The Army and the manufacturer are testing other materials which would enable the nozzle to be used with all liquids. Preliminary results of a new seal appear to be favorable.

The question might be raised as to why the Army didn't come up with a system comparable to the local service station automatic shutoff system rather than have the receiver protrude so deeply into the fuel cell. The Army did look at this system but it proved to be completely unreliable. The system neither prevented spillage thereby decreasing the chance for a fire nor did it prevent snow, ice, rain or dust from entering the fuel cell.

The closed-circuit refueling system is being fielded and in order to stop the hot refueling mishaps it is now up to each unit in the field to requisition nozzles mishaps it is now up to each unit in the field to requisition nozzles for refueling trucks and forward area refueling pumps. The Nozzle Assembly Kit Closed-Circuit Refueling, FSN 4930-478-5728, should be requisitioned from the Sharpe Army Depot. Units should requisition the nozzle on a one for one basis with the standard gravity fill nozzles presently authorized. The standard gravity fill nozzle should be retained for contingency purposes in refueling aircraft not equipped with the closed-circuit receiver cap. Once the items are onhand every petroleum specialist, crew chief and pilot should become thoroughly familiar with the use and handling of this piece of equipment. Let's stop needless accidents with hot refueling.

Managers Come In Different Sizes

Problems - Saf

James R. Woods, DAC
Aviation Safety Officer
Atlanta Army Depot

MANAGERS COME in different sizes and shapes. Their attitudes vary in relation to how they view a situation and their individual responsibility. To some any situation requiring a decision becomes a problem. This keeps them awake at night and sometimes during the day too. But, if we wanted to place two commanders into a stereotype configuration and examine their reactions to a need for action, we could view from a distance the actions of two commanders—Commander Excitable and Commander Decidable. To watch these two birds in their lair we need to feather the nest with some situation and some action.

First, we observe Commander Excitable as he paces his office floor bemoaning his poverty and circling his desk with the rug nap tickling his ankles. We can hear his gentle voice as he bellows

And Their Attitudes Vary

Solutions-

ety!

for his executive officer, "Hey, Joe, what's with this Captain Nitpick? We appoint him aviation safety officer and this aviation survey report he just filed looks like it should be processed by the chaplain. Hasn't he ever heard of our base safety office? We're not always getting a lot of junk like this from those people. Why is Nitpick filing such reports?"

With Old Joe, the XO, just standing there Commander Excitable continues to roll on non-stop. "Nitpick is complaining that we don't support the ASO. Why, it was just last month that I called and told the base safety officer that I wanted complete coordination between the safety people and the maintenance people. . . and that included the ASO.

"Now here is another of these surveys and he is complaining about the police of the area. What

the devil does policing the area have to do with aviation safety anyway? Nitpick should be able to get with the hangar chief and get the area policed up. Why send this junk on up to me? I have better things to do. I guess he wants me to jump into my staff car and run down and police the area myself.

"And look here, Nitpick is complaining about not running up the engines every 3 days. If the lubrication system is so inadequate that we can't let an engine set for a week, we need some new engines or some new oil. I know the manual says to run them up every 3 days but that is nonsense.

I don't run my car engine every 3 days when I go on TDY for a couple of weeks. I guess I ought to have him run over to the house and turn it over for me."

"But Commander. . .," the executive officer starts to say and never finishes as Commander Excitable rambles on, "Look here at this jazz again about batteries not being disconnected while the birds are in the hangar. How are we going to get our aircraft in and out of the hangar with any flying time if we have to connect and disconnect the batteries every time we park one? That's just like this comment about empty and partially empty fuel cells in aircraft parked in the hangar for a little maintenance. We don't have time to keep draining those tanks all the time and it sure doesn't make good sense to me to keep them full while they are sitting around for some wrench bender to play with."

Old Commander Excitable is really getting up to flying speed now. "And look here," he expounds waving papers, "Nitpick is back on that tire thing again. He wants them rotated every 48 hours or else blocked up to relieve the load on them. What are tires for if they don't support the load? Maintenance has enough to do now without spending all its time pampering Nitpick."

The executive officer is sitting down now and just shaking his head because he knows this will be a long afternoon. He'll just have to wait until Commander Excitable runs down.

Commander Excitable hovers by his desk and growls, "Nitpick must be a misfit. He can't seem to understand what's going on. Here he is complaining about Lieutenant Colonel Fuzz not taking his regular physical examination and not getting in his flying time. Fuzz has more time getting into and out of aircraft than Nitpick has in the service. I have had Fuzz working overtime on our budget and Nitpick wants him to go practice flying. Hell's bells, Fuzz can fly in his sleep better than most of these yardbirds we call pilots can fly awake. Fuzz is a Senior aviator and has been flying for years. . ."

Commander Excitable's voice trails off as he reads with amazement showing in his face. "Look at this! Now he wants orientation and standardization rides. He claims they are not being conducted. What does he want—guided tours? That bunch of characters we have as pilots have been flying for years. Why, even most of our young ones have had two tours in Vietnam. Now if Nitpick wants someone to learn to fly we can arrange for a short tour, starting say like with a PCS for Nitpick."

"And look here, he's not even consistent. Here is a typical gripe. Lieutenants Morehours and Eagerbeaver were in the air all day on the 20th on assigned missions, then they pulled some assigned night flying time and set down about 2400. Now just because they cut out again at 0800 on the 21st for cross country, Nitpick is having a fit. Those two birds would have been up to 2400 or better chasing some babe or playing cards anyway. Anyhow, you have to hogtie them to keep them out of the air."

Commander Excitable sort of calms down as he remembers some of his younger days as a junior grade officer—shavetail style—and then he starts

in again, "And this incident business. . . those four near-accidents. . . he claims we had four precautionary landings in the last 6 weeks and he claims this indicates a need for more command emphasis on aviation safety. I'm behind safety all the way; tell him that every month when he brings the subject up. What we need is mechanics who know a box end from an open end.

"Nitpick is going to make an old man out of me," grumbles Excitable. "Here he is in a lather complaining about pilots failing to listen to instructions from air traffic control (ATC). We have some hot pilots in this outfit. He is complaining because Lieutenant Taxifirst did not contact the tower before starting to taxi on the 25th and almost clobbered a fuel truck. What the devil is a fuel truck doing in the middle of the taxi runway anyhow? Check on that truck driver for me and see if he has a driver's license. He ought not to have one if he is going to run all over the place in a tank truck.

"And *this crack* about the ATC boys will just knock your hat into the creek. He claims Tower Controller Sad Sam sounds like he has a mouth full of cold grits and is using poor phraseology, doesn't speak clearly and distinctly and talks too fast for clear copy. Then Nitpick claims Old Sam gets mad when the pilot asks him to say again some transmission. I just don't believe Nitpick has a happy family life. He just does not seem to like anyone. We got to do something about that boy. . . ."

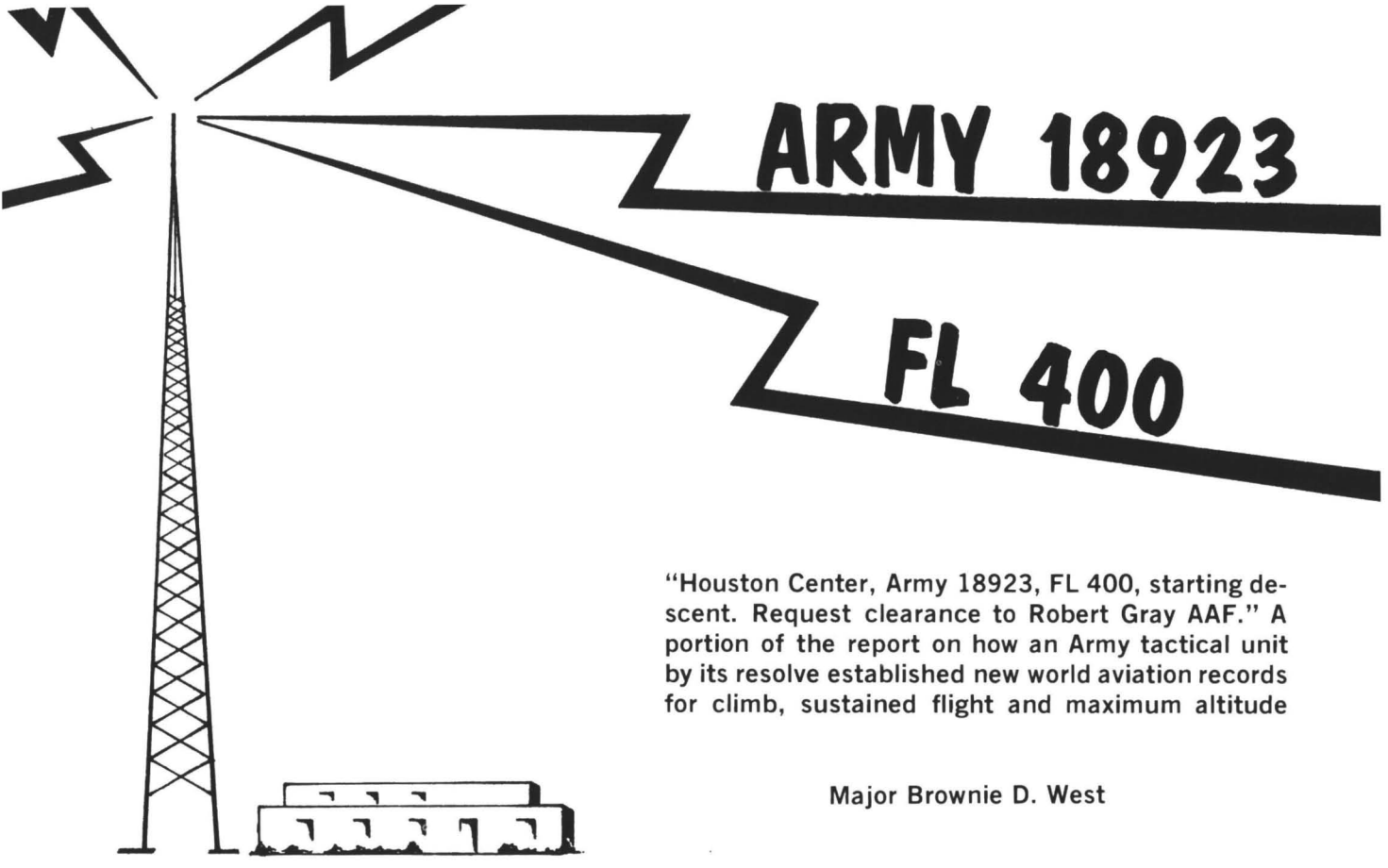
By this time you probably have had enough of Old Excitable, so let's slip over to where Commander Decidable is reviewing his aviation survey report. As we slide over into our approach we can hear him addressing his executive officer, "Charlie, I have just gone over this aviation resources management report our ASO, Captain Smallpoint, filed. He pointed out some four near-incidents and/or precautionary landings in the last 6 weeks along with other items that make me think I had better take a look at our safety and maintenance practices.

"We have some repetitions on failure to run up engines and you know what that does to the hydraulic systems as well as to engines. Also, some of these hotshots we have don't realize that the best way to pop a wheel on a landing is to fail to rotate tires or to take the load off them if they can't be rotated every 48 hours. Let them pop a tire on a cross wind landing and they'll wish they had paid some attention.

"Yes, we made a right choice when we put CPT Smallpoint down as our ASO. He doesn't miss much, but what he calls incidents I call *indicators*, and they indicate I had better take a look because somebody is getting careless. I want to get some *where, when, and whys* answered before I have to start filling out a lot of letters answering questions on a real accident. Now, here is what I want you. . . ."

So, as we leave Commander Decidable and head for home we should consider that no one is always completely right and no one is always completely wrong. We want to be a lot closer to right than wrong though. So, if you are a commander or aviation safety officer or pilot or whatever your position, where do you fit into the current scene? We all have a part to play; the question is just how well do we play it.

Oh boy! Some shade at last.



"Houston Center, Army 18923, FL 400, starting descent. Request clearance to Robert Gray AAF." A portion of the report on how an Army tactical unit by its resolve established new world aviation records for climb, sustained flight and maximum altitude

Major Brownie D. West

EVER HEAR AN Army aircraft report 40,000 feet? CW2 Thomas G. Yoha reported FL 400 (flight level 40,000) to Houston Center during an international record setting flight in Army OV-1C #67-18923.

The 293d Aviation Company (SA), 55th Aviation Battalion (Cbt), Ft. Hood, TX, conducted flights on 8 and 9 June 1971 which represented the first attempts ever made by an Army tactical unit to establish official world performance records. Previous records set in Army aircraft were limited to joint military/manufacturer attempts. CPT Richard J. Steinbock was copilot on the flights which successfully culminated 4 months of effort in coordinating, planning and preparing for the historical events.

In accordance with AR 95-28 a request for authority to establish performance records was forwarded by the 293d on 29 February 1971. Reasoning, as stated in the request, was to carry out Department of the Army and Department of Defense policy of informing the people of the continuous advancement in United States engineering and technological capabilities. Final approval was granted at Department of Defense, Office of Public Affairs.

The unit proposed to establish world altitude and time-to-climb records in Class C-1-e, Group II. This class comprises turboprop light airplanes weighing 3,000 to 6,000 kilograms (6,614 to 13,227 pounds). The Grumman OV-1C Mohawk, powered by two T53-L-15 Lycoming turbine jet engines, weighed 11,875 pounds on takeoff. Maximum altitude was expected to exceed 40,000 feet. Time-to-climb to 3,000, 6,000 and 9,000 meters was expected to be approximately 3, 7 and 12 minutes respectively.

Performance record flights made by CW2 Yoha and CPT Steinbock were officially monitored by the National Aeronautic Association (NAA). NAA is the U. S. representative to the Federation Aeronautique Internationale (FAI) of Paris, France. FAI is the international authority for certification of world records. NAA representative, Mr. A. Earl Hansen, observed the installation of equipment to register performance and he officially monitored each flight.

The Mohawk performed superbly as anticipated. On 8 June 1971 aircraft #923 took off at 0650 hours from Robert Gray Army Airfield at Ft. Hood, TX, and climbed to 3,000 meters (9,843 feet) in 2 minutes 46 seconds. An altitude of 6,000 meters (19,685 feet) was attained in 5 minutes 46 seconds. A third climb record was set at 9,000 meters (29,528 feet) in 11 minutes 14 seconds. At approximately 33,000 feet a compressor stall caused CW2 Yoha to shut down #2 engine and return to Robert Gray. After a thorough

engine inspection 923 took off the following afternoon and climbed to a maximum altitude of 39,880 feet. A sustained flight record was set at 36,352 feet. These records are not astounding when compared with records established by jet aircraft, however, the Mohawk's performance is truly significant for turboprop airplanes. The climb records established at 3,000 and 6,000 meters surpassed previous records set by turboprop airplanes in all classes.

Army aviation can justifiably boast this achievement by professional aviation personnel. From the coordination, planning and persistent efforts of CW2 Yoha and CPT Steinbock emerged approval for official record attempts by an aviation company for the first time in the history of Army aviation. Their coordination with NAA established procedures for conducting the record flights. Coordination with FAA Regional Headquarters, Fort Worth, TX, and Houston Air Traffic Control Center was necessary for clearance to high altitudes. Other individuals deserving recognition include Mr. John Mako and Mr. Jack Lacey, Grumman Aerospace Corporation representatives who advised and assisted in planning the attempt. They gave assistance to CPT David B. O'Hara, 293d maintenance officer, and to the OV-1 mechanics who prepared aircraft 923.

The OV-1 mechanics removed all unnecessary equipment and installed a baragraph, an additional altimeter, stop watches and movie cameras to record performance. Mr. James Morority, AVCO Lycoming field engineer, and Mr. Carl Herrington, field representative, assisted in preparing the engines. The two best L-15 engines available were selected and installed on aircraft 923. SSG Ray E. Okerson's turbine engine mechanics visually inspected each engine and conducted performance tests. They adjusted each engine for peak performance and determined the maximum available power which was to be safely utilized on takeoff.

Under the guidance and supervision of LTC Thomas Birriel-Carmona, chief flight surgeon, III Corps and Ft. Hood, elaborate plans and procedures were outlined to prepare the crew for safe flight into rarefied atmosphere. Air Force regulations prohibit flights above 25,000 feet in aircraft without pressurized cabins. OV-ls do not have pressurized cabins but boast an excellent diluter demand oxygen system capable of supplying 100 percent oxygen under pressure.

Complete physical examinations were administered and simulated flights were made in an altitude chamber. The chamber flights, profiled with programed climb rates to a peak altitude of 46,000 feet, simulated almost exactly what the crew would experience on actual flights. Each crewmember inhaled 100 percent oxygen for 2 hours prior to takeoff. Entering the aircraft cockpit each crewmember unplugged from portable oxygen bottles and plugged into the aircraft oxygen system with zero dilution. Preoxygenation was necessary to rid the blood system of nitrogen. Expansion of nitrogen at high altitude produces bubbles in the blood which become intolerable to the human body above 25,000 feet. These preparations minimized possibility of physical harm resulting from exposure up to 46,000 feet.

The true significance of achieving these records is not just the superb OV-1 performance. It took sterling performances by the individuals who planned, prepared and flew Mohawk #923 into the record books.

Crew preoxygenation 2 hours prior to takeoff. L-R, CPT Steinbock, CW3 Halliburton and CW2 Yoha

Maintenance

WHEN REFUELING

Aviation Fuels: Since fueling or defueling operations represent the most frequently repeated handling of flammable materials, let's list a few "do's and "don'ts."

- Always fuel in the open air, performing such operations at least 150 feet from any type of building. Also, the fueling vehicle should not be closer than 20 feet to the aircraft.
- Always make grounding and bonding connections before opening tanks.
- Always make sure the proper grade and quantity desired is dispensed.
- Always stop fueling if any hazard becomes apparent.
- Always report accidents, spills and mistakes immediately.
- Always make sure no maintenance is being performed on the aircraft during fueling operations.
- Never leave the nozzle unattended during fueling operations nor allow the nozzle trigger to be blocked or tied open.
- Never carry matches or a cigarette lighter during fueling operations.
- Never wear clothes that are wet with fuel.
- Never carry loose articles that can drop into aircraft tanks.

The addition of the gas turbine aircraft engine into the Army inventory makes it imperative that the hazards peculiar to JP-4 fuel be thoroughly understood.

- The fuel-air mixture of vapor above the fuel level in tanks and vents or from spillage on ramp, clothing or rags will be combustible under most conditions of temperature, pressure and altitude. This is in contrast with vapors from gasoline or kerosene which would normally be either too rich or too lean and have a more limited combustion range. For sea level pressure the temperature range for combustion of JP-4 vapor is very broad, about a minus 10 degrees F. to a plus 80 degrees F.; for aviation gasoline under the same conditions the combustion range is about 0 degrees to a plus 30 degrees F. Thus, the enforcement of no-smoking regulations becomes doubly important in areas where JP-4 fuel is stored or transferred.
- Bonding the aircraft to the fuel servicing vehicle and then grounding the vehicle to the earth will equalize the electrical potential between these units but will not prevent the formation of an electrical charge which can produce sparks along the surface of the fuel. This type of charge can be minimized by avoiding splashing and excessive surface agitation during fueling operations. The possibility of static discharge is the most hazardous single source of ignition in handling JP-4 fuel.

★ ★ ★

Hold Those Shims: Before you waste those hard to get shims for your Kiowa swashplate — HEED! First, try this simple procedure. Adjust swashplate friction by manipulating torque values from minimum to maximum starting at minimum and adjusting in 5-pound increments until satisfactory adjustment is obtained. After following this procedure it will be found that in most cases new shims will not be needed at all.

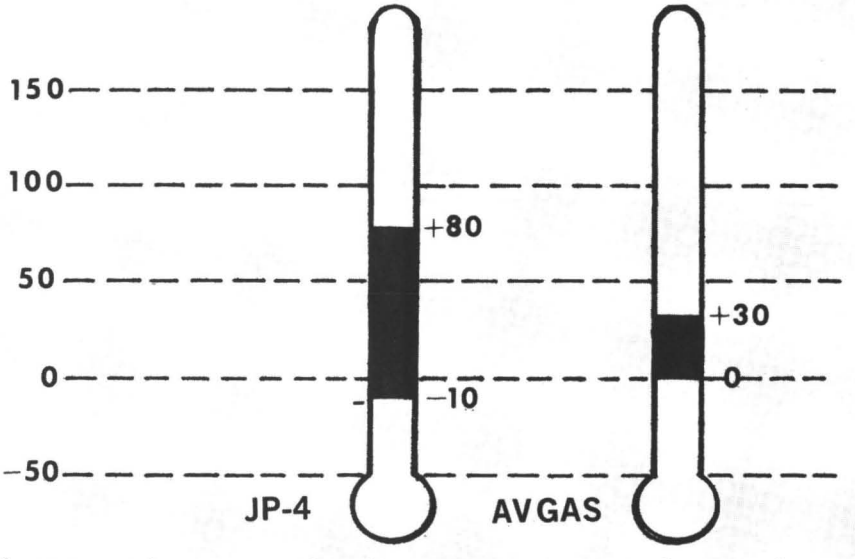
★ ★ ★

Tip From The Top: During our careers as aviation mechanics some of us have a tendency to

Matters...

Furnished by the Department of Maintenance Training, Ft. Rucker, AL

Temperature ranges in which the fuel-air mixture or vapor above the fuel level in tanks and vents or from spillage on ramps, clothing or rags at sea level is flammable



become set in our ways. In other words, we do a certain job in our own special way. This can mean many things from using only our own personal tools to having our work area in one particular part of the hangar.

All of us "older" mechanics and supervisors have our own little idiosyncrasies about the way we work. What we tend to forget, however, are the basics that we were taught back in school. One thing that was taught to us was the proper way to protect ourselves and our clothing from becoming fouled in running aircraft components. I have listed just a few that I remember.

- Don't wear metal taps on shoes or boots as they could cause sparks.
- metal ranks insignia or unit crest worn on the cap can cause damage to rotor blades if blown through them.
- Sleeves should be taped (masking tape) to minimize the possibility of being snagged by rotating components.
- Jewelry should not be worn when working around aircraft because of the possibility of being snagged by rotating components or shorting out the electrical systems.
- Clothing should never be washed with aviation fuel.

These are just a few; there are many more "don'ts" one can think of. And there's plenty of room to elaborate about jewelry (wedding bands and wrist watches)!

Caution—All UH-1 Pilots: Before leaving the aircraft ensure the battery switch is off and the voltmeter selector switch is in any position except the battery position. If left in the battery position the voltmeter instrument will monitor battery voltage and drain the battery.

Climbing Collective: During preflight pay extra attention to the lockplate on the underside of the collective hub to ensure that the screws are installed and safetied. If the lockplate should come off in flight, the collective hub would climb the mast causing the pilot to lose control of the aircraft.

Army Aviation Reserve

Continued from page 4

installations and aviation facilities.

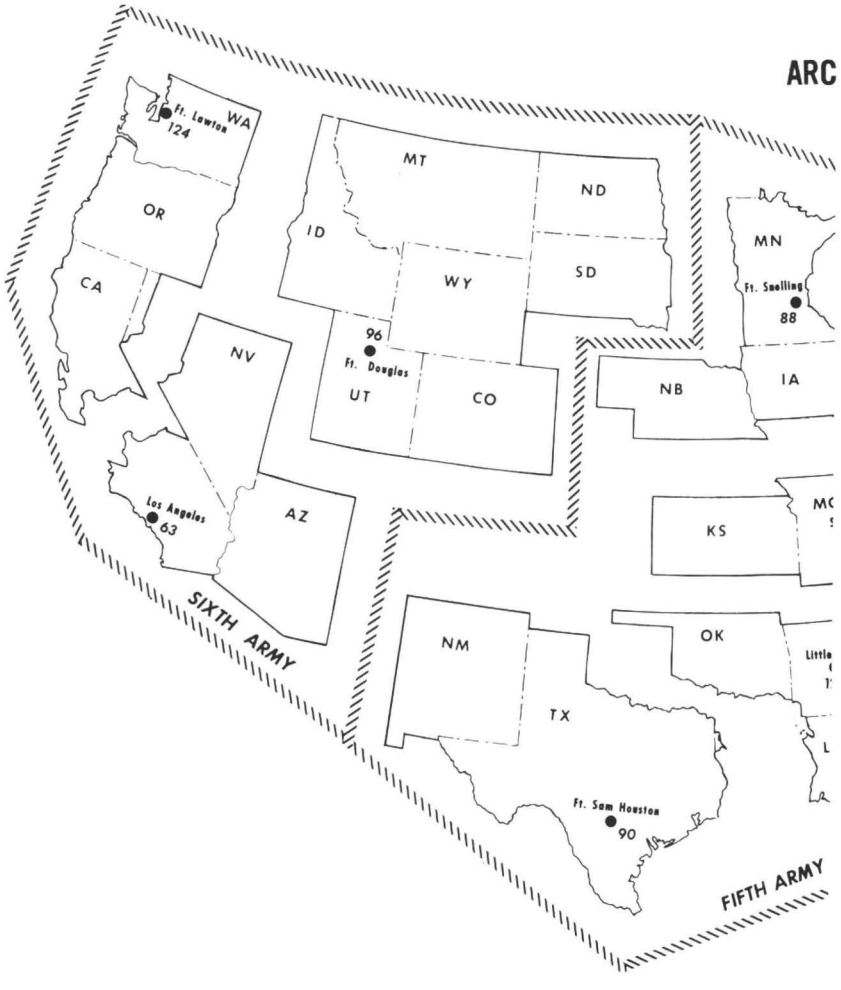
It is an expensive and complex problem to acquire adequate facilities for aviation training, operations and maintenance. In those areas where appropriate military facilities are not available, leases are negotiated with civilian operators at local airports for use as Reserve aviation facilities. Despite the difficulties this multifacet problem is being resolved on an almost daily basis. We anticipate having it completely solved by early spring.

The Army Reserve now has the "green light" to take care of its own aircraft. In the past Army Reservists performed only organizational maintenance on their aircraft, relying on the active Army for higher level support. Now, direct support (DS) is being performed at many Army Reserve aviation facilities. A direct support capability is found where the aviation unit has a direct support or higher level of aircraft maintenance mission; or has an integrated direct support or higher level of aircraft maintenance mission; or has an integrated direct support maintenance capability in its TOE; or the unit is so far removed from active Army maintenance facilities to warrant Army Reserve DS maintenance on the basis of economics and operational necessity.

The number of aviation maintenance shops also is expanding. By the end of FY 73 we will have nearly doubled the number of these maintenance facilities. The bulk of this maintenance work is performed by Army Reservists in a "dual status," that is, they occupy a unit aircraft mechanic position and at the same time are hired as fulltime civil service employees as Army Reserve technicians. The receipt of increasing numbers of aircraft, the new DS mission and an expanded flying hour program have combined to create a massive demand for these dual status maintenance personnel, opening up job opportunities for many who are now leaving active duty. Where in July 1970 we had less than 100 aircraft maintenance technicians in the entire program, by the end of FY 73 we are forecasting a requirement for more than 600.

Along with an expanded aviation maintenance program our stepped-up effort has brought on a need for increased operations and flight instructor personnel. We are now putting into reality newly granted authority for Army Reserve aviation facilities to be staffed with fulltime aviators and enlisted personnel in a dual military/civilian status in operations and flight instruction positions. These additional Army Reserve technicians will provide for truly functional, supervised, administered and coordinated Army Reserve aviation facilities.

While the benefits of joining the Army Reserve are many and have been discussed at length (again, see AVIATION DIGEST,



July 1971), many persons do not know how to go about finding a spot and signing on with the Army Reserve.

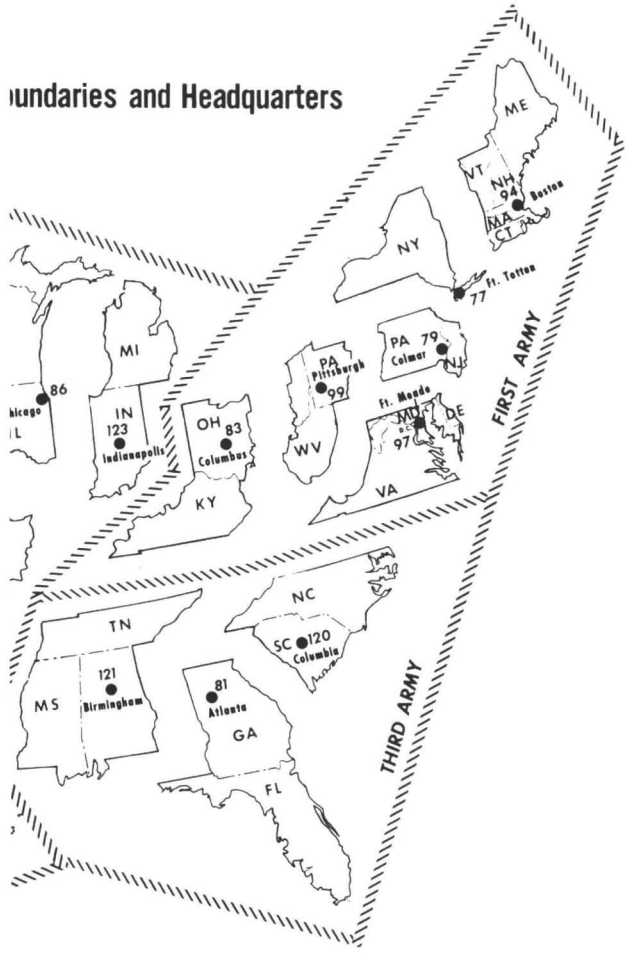
The Army Reserve has the same chain of command as does the active Army down through the CONUS Army level. The next lower level of command is that of the Army Reserve Command (ARCOM), an Army Reserve headquarters commanded and staffed by Army Reservists. Except for certain other general officer commands, these ARCOMs command all Army Reserve units in specific geographical areas and retain detailed information regarding unit locations, vacancies and prospects for civilian employment. Locations of these ARCOMs, their respective areas of command and mailing addresses are shown below.

Beginning in January 1972 special Army Reserve in-service recruiters have been stationed at 25 major active Army posts in CONUS and at 10 U. S. Army stations in Germany to assist active duty personnel leaving the service to find units in the Army Reserve. You can contact your post recruiting office to make contact with these Army Reservists. They will assist you in locating a unit upon your release from active Army duty.

If you do not make this contact prior to leaving active duty, you can contact the ARCOM nearest you when you return home to get information regarding aviation element location, aviator vacancies, enlisted vacancies and opportunities for fulltime employment.

This is the reality of Army aviation in the Army Reserve. It's a program that is on the move, one which offers you a chance to continue your military aviation career and may offer you a civilian employment career in Army aviation. It's a program in which you belong.

ıundaries and Headquarters



63d USAR Command
Hazard Park USAR Center
1350 San Pablo St
Los Angeles, CA 90033

77th USAR Command
Ft. Totten USAR Center
Flushing, NY 11359

79th USAR Command
Twin Town Industrial Park
Advance Lane and
Bethlehem Pike
Colmar, PA 18915

81st USAR Command
699 Ponce de Leon Ave
P. O. Box 8337
Atlanta, GA 30306

83d USAR Command
Columbus Support Facility
Building 64
530 Buckingham St
Columbus, OH 43215

86th USAR Command
1819 W. Pershing Rd
Chicago, IL 60609

88th USAR Command
Building 67
Ft. Snelling, MN 55111

90th USAR Command
Dodd Field, Building 1610
Ft. Sam Houston, TX 78234

124th USAR Command
Ft. Lawton, WA 98199

94th USAR Command
Boston USAR Center
South Boston Annex
666 Summer St
Boston, MA 02210

96th USAR Command
Ft. Douglas, UT 84113

97th USAR Command
Ft. George G. Meade
MD 20755

99th USAR Command
USAR Center
250 Mount Lebanon Blvd
Pittsburgh, PA 15234

102d USAR Command
5909 Kennerly Ave
St. Louis, MO 63112

120th USAR Command
709 Saluda Ave
P.O. Box 5957
Columbia, SC 29205

121st USAR Command
3620 Eighth Ave, South
Birmingham, AL 35222

122d USAR Command
Continental Building
Main and Markham Sts
Little Rock, AR 72201

123d USAR Command
1616 North Meridian St
Indianapolis, IN 46202

MUTUAL SUPPORT IN ARMY AVIATION

Lieutenant Colonel Arthur E. Magary
Aviation Staff Officer
Continental Army Command

MUTUAL SUPPORT is taking on increased significance in Army aviation. AR 11-22, dated 16 July 1971, defines mutual support as a program of identifiable, concerted, working relationships between the active Army, the Army National Guard and the U. S. Army Reserve that are beneficial to one or more of the elements in any combination of involvement. When applied to Army aviation, mutual support can provide the key to successful operations and training in today's austere environment.

First, mutual support affords an excellent opportunity to conserve funds and manpower during accomplishment of the Army aviation mission of all three components. Secondly, it will materially assist in enhancing the overall readiness posture of the Army as a whole; and third, it will form a bond of mutual understanding between the three components which will reinforce the "one Army" concept.

Currently, aircraft fleets of the Reserve Components are being modernized and expanded in line with the President's policy to place more reliance upon our Reserve forces. This expansion and modernization should be complete by the end of fiscal year 1973. At the same time the active Army aircraft inventory in CONUS will be increased significantly due to the withdrawal of

LTC Magary reveals mutual support to ideas through which the three components—the active Army, Reserve and National Guard—could cooperate to improve Army aviation . . . there would be a conservation of money and manpower, an enhancement of readiness and a realization of the "one Army" concept

troops from the Republic of Vietnam. The aviation mutual support program gives us a vehicle with which we can effectively manage these critical resources in a manner that will assure that all reasonable operations and training requirements will be met with efficiency and economy.

Training is one of the principal areas where the mutual support program can be made to pay off. At the outset it may seem as though support is unilateral with the active Army on the giving end; this will be because of the infusion of newer model aircraft into the Reserve Components and the need to train Reserve Component aviators in the operation and employment of such aircraft.

Individual training of aviators and aircraft crews will be high in the order of priority of mutual support training. Many of the Reserve Component aviators requiring transition will be able to attend the U. S. Army Aviation School at Ft. Rucker, AL; however, others will not be able to take time off from their primary employment to attend transition courses. In this instance the Reservist may be able to receive his training at an active Army installation or, if that is not feasible, mobile training teams can be established to conduct the training at the Reservist's home station. Still another method — conducting transition training during the Reserve Component unit annual training period — was accomplished quite successfully last summer at Ft. Sill, OK. A number of aviators from the 536th Assault Support Helicopter Company, Texas National Guard, were transitioned into the CH-47 through the efforts of the 154th Assault Support Helicopter Company at Ft. Sill, following a syllabus from the aviation school. This represents a mutual support effort worthy of the highest recognition.

Mutual support during unit training may present more of a problem simply because the ways in which this support can be furnished without infringing upon command responsibilities and prerogatives are limited. Guidance from active Army "host" units to Reserve Component units and assistance during preparation of SOPs and other operational guides will constitute the major portion of such support to the Reserve Components.

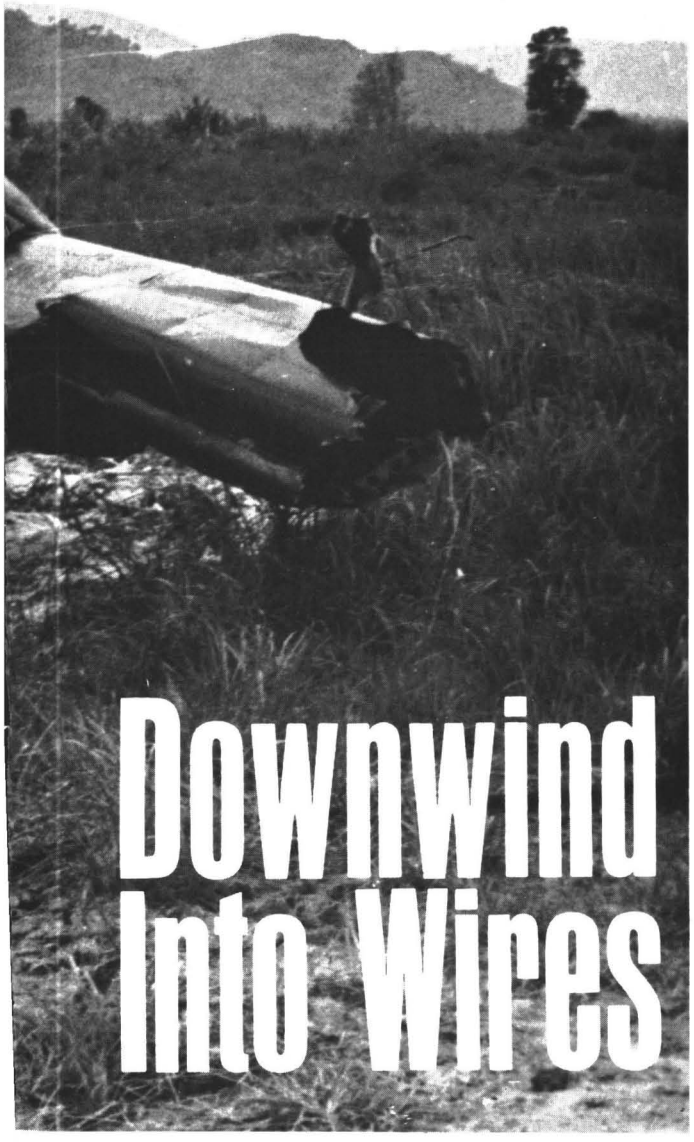
On the other hand, it is entirely conceivable that Reserve Component units will be able to provide support to active Army units during field exercises and other phases of unit training involving flight operations. In fact, commanders of all three components should be constantly on the alert for situations where mutual support can be employed beneficially during unit training.

Airmobile training probably presents one of the best opportunities for mutual support. Actions are now underway to reinforce this type of training within the Reserve Components and to increase the airmobile potential of the Army. The mix and location of aviation companies of all three components is such that with a reasonable amount of prior planning aircraft requirements for airmobile training should be met without too much difficulty.

Understandably, mutual support in training ranks high in the order of importance. However, the day-to-day operational requirements of the Army will also command considerable attention in use of aviation resources in a mutual support role. This is the area where the greatest economics can be effected. Until the recent modernization and expansion of the Reserve Component fleets, little if any capability existed for them to support their own requirements and the thought of supporting active Army operations rarely crossed anyone's mind. Now, however, since the three components will be on an equal footing with regard to aircraft capability, interrelationship between the components in meeting operational requirements can be used to good advantage in assuring that the total capability is used economically and efficiently.

These are only a few of the ways in which mutual support between the active Army and the Reserve Components can be made to pay off. Many other possibilities exist if we approach this program with an open mind and ingenuity. The time has come to exploit the maximum potential of aviation assets we now have in all three components. Mutual support, properly planned and executed, gives us the best means to accomplish this objective.

At a busy heliport, the AC of this UH-1 did not question tower clearance for a downwind takeoff along a path crossed by powerlines and telephone cables. When he attempted to go under the wires, the tail rotor was torn off and the helicopter crashed



Downwind Into Wires

A UH-1H, operating out of a heliport on a resupply mission, crashed during takeoff. Aboard were an aircraft commander, pilot, crew chief, gunner, four passengers, approximately 450 pounds of cargo and 750 pounds of fuel. The AC made a hover check—35 pounds at 95 percent N_1—and was cleared by the tower to take off south. The AC increased torque to 36 pounds and 97 percent N_1. Powerlines and telephone cables ran east and west across the takeoff path and the AC didn't feel he could make it over them. He decided to go under the wires because it was too late for him to abort. The tail rotor hit the wires and it and the 90-degree gearbox were torn off. The helicopter pitched up and began to spin rapidly. The AC rolled off throttle and the UH-1 settled. He pulled pitch to level and cushion, and the helicopter started to spin again. It hit the ground, bounced and rolled on its left side.

One passenger was thrown out approximately 100 feet above the ground and received major injuries. The AC, pilot and three other passengers sustained minor injuries, while the crew chief and gunner escaped uninjured. The crew had made 16 takeoffs from the same location on the day of the accident.

Board findings:

"The AC did not question the tower clearance for a downwind departure and did not plan his takeoff to allow for evasive action to clear obstacles. Due to the amount of traffic at the heliport, it was necessary for helicopters to be cleared for low level departures and landings.

"The tower cleared the helicopter for a downwind takeoff.

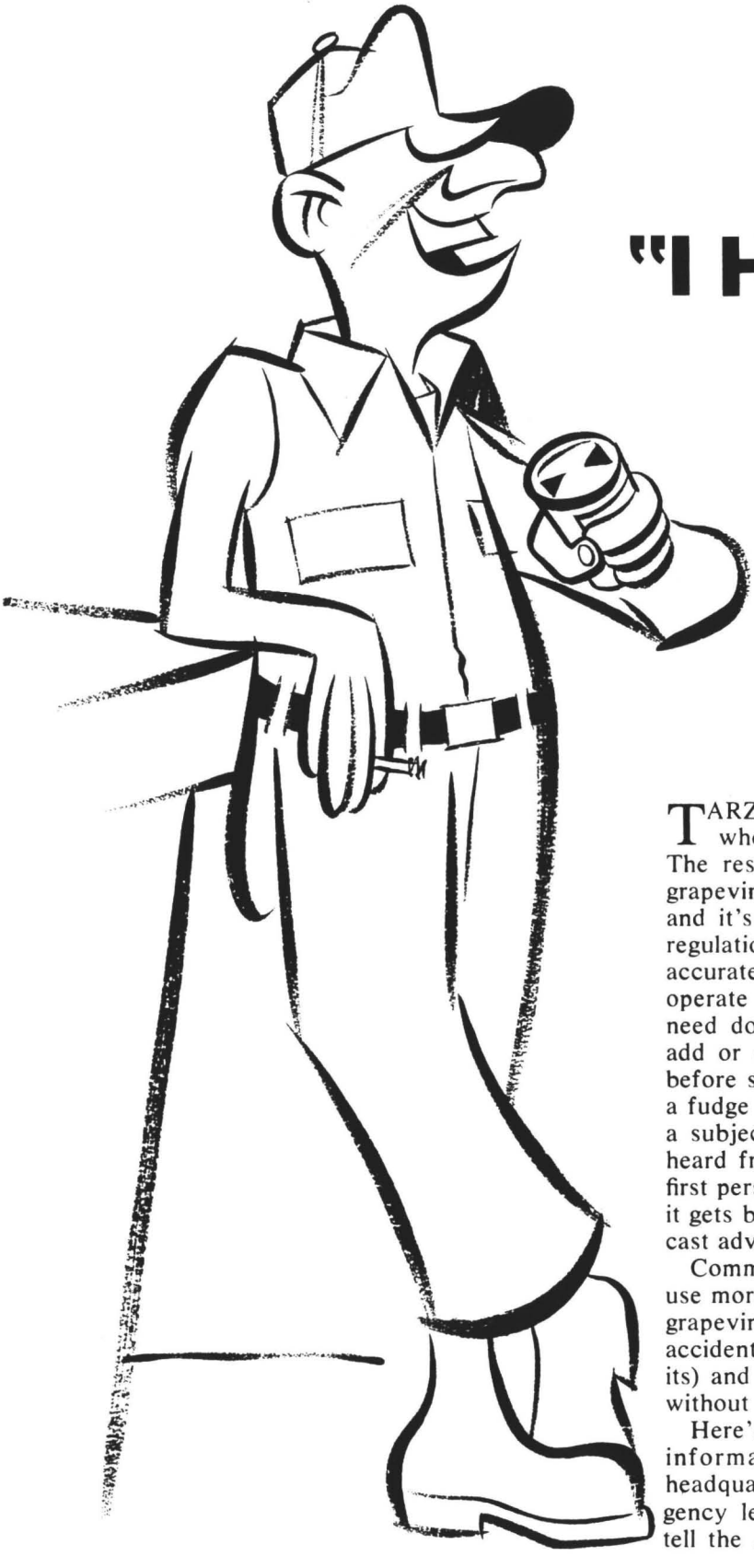
"Injuries sustained by the passengers resulted from the passengers not wearing seatbelts as required by safety directives. Prior to this flight, no passengers had been carried and the seats were not in place. The passengers sat on the floor, without using restraint devices.

"Wires and cables in the vicinity of the heliport were not properly marked."

Board recommendations:

"Continued emphasis on the hazards of downwind operations.

"Crews be made aware of responsibilities for questioning clearances which they know are contrary to safe operations."



"I HEARD IT FROM A RELIABLE SOURCE"

TARZAN AND HIS friends were the only ones who used the grapevine for transportation. The rest of us use it for communications. The grapevine is only used for advance information and it's not controlled, so there are no rules or regulations to follow. Information need not be accurate and you don't need a special MOS to operate this vast communications system. All you need do is listen and repeat. When you repeat, add or delete anything you like to your version before sending it on. When quoting numbers, use a fudge factor of at least 50 percent. To originate a subject for the grapevine, start by saying, "I heard from a reliable source . . ." Tell it to the first person you see, then try to recognize it when it gets back to you. Most grapevine subjects forecast adverse actions.

Communications is one of the things we could use more of but not the grapevine type. When the grapevine receives a worthwhile subject such as accident prevention (in the form of assistance visits) and twists it into adverse action, we can do without it.

Here's a typical start of a topic for the twisted information system. An individual was in the headquarters building to get approval for emergency leave. Here's what he overheard the CO tell the ASO: "The safety team visit will be over

USAAAVS aviation safety assistance visits are made to help eliminate hazards . . .

Arnold R. Lambert

this time next week. You'll be a fulltime safety officer because I'm relieving you of all other duties until then." Here's how this was repeated to the maintenance NCOIC: "I heard from a reliable source that a safety team is visiting and we're going to be working overtime next week. Also, we're getting a new full-time ASO because the one we had was relieved of all duties."

Now the grapevine is in full swing. The maintenance NCOIC gets all his men together and throws in another key word of his own. "We're going to have a safety *inspection.*" Right away, everybody gets overtorqued. They're all told there will be no smoking in the no smoking areas during the safety inspection. Stogie Joe and Nicotine Nick take it on themselves to rope off an official smoking area in the corner next to the paint storage lockers. Ash trays and butt cans are still scattered throughout the shop but the official smoking area should impress the safety inspection team. Following instructions, a mechanic located a stack of current TMs and placed them on the work benches. He neglected to tell the maintenance NCOIC that the only TMs he could find with current dates were -35s. (Yes, it was an organizational maintenance shop.)

Once the grapevine went into full swing, an attitude developed—"We'll think safety until the survey is over." Aviation safety is or should be an attitude, but definitely not a part-time one. A full-time safety-conscious attitude is what we all need. What adverse action can possibly result from accident prevention?

A safety survey, picked up by the grapevine, seems to have less impact in the tension department than safety inspection. USAAAVS hopes to eliminate all the tension by calling this program assistance visits and assuring aviation units that their only purpose is accident prevention. Hopefully, there isn't too much the grapevine can do with this.

Army aviation's primary goal is mission accomplishment without mishaps. USAAAVS's primary goal is accident prevention and assistance visits are one of the most effective ways to accomplish this. Assistance teams consist of highly skilled personnel with the ability to help you and your accident prevention program. They are not nitpickers and there should be no shuddering when their arrival is announced. The only personal satisfaction they derive from their job is the fact they may help you detect and eliminate hazards.

When reporting their findings, an assistance team tells it like it is. If they've found a spade, that's what they call it. And they're not reluctant about reporting areas of excellence they find.

RELIABLE SOURCE

Following are some observations made during recent assistance team visits. These conditions were prevalent in most units visited, indicating trends have developed. Many of the units visited had several areas that were above average to outstanding and they deserve a pat on the back. But our interest is accident prevention, so we'll deal with the areas where deficiencies were reported. As you read through these, ask yourself if they exist in your unit, then start the ball rolling to eliminate the hazards. The four fields of interest are Command Implementation, Operations/Facilities, Maintenance and Supply and Standardization.

Command Implementation: The need for closer day-to-day supervision and more forceful implementation of directives pertaining to the aircraft accident prevention program was indicated. AR 95-5 requires an accident prevention program based on the items it contains. Assistance visit teams found only vague awareness of the purpose of TB 1G-1, dated July 1971, which points out Army aviation accident prevention as a major area of interest into which the Inspector General will inquire because of its Army-wide application. In some cases, local directives, such as SOPs, were found to be in rough draft form only.

Operations/Facilities: This area of interest covers a wide range of specific subjects. There is a recognized need for control towers to be improved. Airfield tower facilities often do not afford visibility of all parking areas on the airfield. Tower radio equipment is often obsolete and requires excessive maintenance. The design of some tower windows creates glare, particularly at night.

Parking and taxi procedures should be studied and revised. Considerable amounts of loose psp were evident in the vicinity of helicopter parking areas. Some heliports are presently unusable at night. Obstructions, including wires, often are not marked. Airfield lighting was found inadequate and excessive uncontrolled vehicular traffic was evident on airfields.

Some crash rescue crews were not fully trained or equipped to cope with aircraft fires. Tools for emergency entrance into downed aircraft were not provided. Hot-suits were not available for some crash rescue personnel and grid maps were obsolete or inadequate.

Two points require command evaluations and action—operation of hot refueling miniports and the lack of tested and marked grounding points. The convenience of hot refueling must be weighed against its inherent risks. Among these are possible losses of lives and equipment from fires that can easily occur during hot refueling operations. In addition, hot refueling introduces hazards of other types, such as rotor blades meshing, since helicopters are not shut down while refueling.

POL storage areas and hot refueling points were not properly maintained. Some refueling points were not properly grounded and fire extinguishers were not available in sufficient numbers. Proper fuel sampling procedures were not being used and fuel sampling jars were not available.

Maintenance and Supply: A lack of qualified personnel in sufficient numbers and nonstandard maintenance management procedures were observed and there was a lack of adequate grounding points and lighting in hangars. Red X placards were not being used for aircraft in red X status on the ramps.

In some cases, an aviation safety program was not established at the mechanic and crew chief level. Maintenance publications and bulletin boards were not readily accessible to mechanics.

Standardization: Standardization programs lacked forceful and actual compliance. No documents pertaining to standardization were currently on hand. Papers were in draft only and had not been published.

We've all heard the old expression, "He can't see the forest for the trees." You may be living with hazards, but you've learned to live with them because they haven't caused an accident—*yet*. It's possible *you* can't see the forest for the trees.

When an assistance team visits your unit, welcome them. Their only purpose is to help you eliminate hazards. This is the straight scoop, undiluted by the grapevine.

If you'd like to get going on hazard elimination in your unit, read Major Roy Hook's article entitled "Spring Fashions," page 58 of this issue.

BROKEN WING AWARD

CW3 KENNETH W. GREEN (center), Army Flight Test Division, was presented the Broken Wing Award by Colonel Robert L. Head, Bell Plant Activity commander, at a special ceremony in his office. This coveted award is presented only to those aviators who have demonstrated extraordinary skill and judgment during an aircraft emergency. Shortly after a takeoff from Meacham Field, Fort Worth, TX, in a UH-1H, Mr. Green experienced engine failure. Though he only had seconds to react, he landed over obstacles in a vacant lot with no damage. Mrs. Green smiles approval.

CAPTAIN WILLIAM E. BOLLING, air mission commander for A Troop, 7/1 Air Cavalry Squadron, was conducting a combat operation in an enemy-infested area of the U Minh Forest in the Republic of Vietnam when his UH-1H engine failed. Instantly, CPT Bolling entered autorotation and informed his crew and passengers of the emergency. He scanned the area and located a small opening in the dense single canopy jungle. CPT Bolling maneuvered his crippled Huey into his selected confined area. As he neared the small clearing, he found it so tiny that he was forced to terminate at an altitude of 20 feet and execute a vertical descent. Once safely on the ground, it was determined that a clogged fuel filter had caused the power loss. Instantly, CPT Bolling took manual control of the throttle and skillfully flew the aircraft out of the hazardous area. CPT Bolling was presented the Army aviation Broken Wing Award for his skill in handling a severe emergency without damage.

Forest Firefighting

PACK YOUR bag! Plan on a week! They need our chopper at the fire! Pick you up in half an hour." There went my quiet Sunday afternoon. An hour later, Jim and I were headed north in our UH-1H to support firefighting operations. Both freshly back from Vietnam, we were far from being experienced aviators. Due to various ground assignments, I had logged barely over 200 hours in my year's tour. Jim had a few more hours, but not many. In that year of combat flying, excepting actual enemy contact, we had encountered no flying conditions more hazardous than those we found supporting forest firefighters in the White Mountains of Arizona.

Among the biggest problems and dangers we found were the people involved and their lack of knowledge and experience in aircraft operations. Our first encounter with this factor came with fuel procurement. The fire operations center was to provide logistical support, including fuel for our

This article was written by the author while attending the Aviation Accident Prevention Course at USAAAVS

Captain Charles S. Thompson

UH-1H, since the airfield we were to operate from had no JP-4. A commercial tanker with 10,000 gallons of JP-4 arrived. The driver had been instructed to offload into local tanks and return immediately. Since the airfield had no tanks, fire operations hauled in two tankers of their own for us to use. One had a couple of inches of gasoline left in it—"That will mix in and burn fine!" The other had been freshly washed out with water—"Nice and clean for you!" It took fast action and a bit of explaining to prevent contaminating that 10,000 gallons of fuel. A solution finally arrived in the form of two Air Force JP-4 tankers.

The next hazard and educational problem was loading. The landing zones to which we were delivering passengers and supplies averaged 7,000 to 7,500 feet in altitude and daily temperatures ran between 70 degrees and 95 degrees F. We had to convince overly anxious support personnel that we couldn't lift and deliver a day's rations for 1,000 men even if the men were tired and hungry. We had to explain it would require two or three loads and someone just would have to wait for supper.

Besides being at high altitude, the landing zones also had every other feature an aviator could ever hope not to find. Most of them were just widened spots in firebreaks or roads, surrounded by high trees and filled with brush, stumps and dust. It took a tail rotor strike on a CH-53 to convince the fire bosses the trees and brush were dangerous and had to be moved. Luckily the pilot managed to get the CH-53 down without further damage or any injury. But the dust was still there. We tried to get water or oil to soak it down, with little to no success. All the water had to go on the fire. Bless the chin bubble! It was the only piece of plexiglass through which we could maintain a ground reference for landing. Every takeoff was on instruments for the first 25 to 50 feet. And us with only expired tactical tickets!

We found that aviators must use constant caution and good judgment in accepting missions from inexperienced ground personnel. The chief of the fire operations center, for whom we were working, wanted to fly to one of the fire camps to confer with several other fire bosses. On the way, he wanted to fly over or near burning areas to check the progress of the fire. This took us through smoke—more instrument flying—and over burning areas where updrafts were a constant danger and a forced landing would have been disastrous.

Arriving at the fire camp, we advised the chief we would have to return before dark due to the hazards of smoke, unfamiliar terrain, lack of radio navigational aids and inadequate lighting at the airport. Just before dark, he finally returned to the helicopter, but not to go home! Several men had been surrounded by the fire and had no ground route of escape.

Ten minutes later, we were airborne and flying over burned and burning areas, skirting around smokey clouds, with an observer in the back who kept saying "ten-four" over the intercom. Darkness moved in and we frequently had nothing for reference except the fires to keep us right side up and oriented. After 20 minutes of futile search, we requested that the trapped men be contacted to determine if they could hear us flying overhead. This was done and the word came back, "They're OK! They got out on their own!" The whole search, with all its hazards, had been unnecessary!

Our evening was not yet over. We had just enough fuel to get back to the airfield, with no extra to allow for such errors as getting lost in the dark. A half hour later we landed to the active runway and, for a grand finale, proceeded to go IFR in dust while maneuvering to our unlighted parking area. I immediately pulled pitch, came up to a 25-foot hover, went back to the active and started over with the ground in view. This time we parked successfully and breathed a well deserved sigh of relief.

These are a few of the problems and dangers we encountered in our nerve-racking week of supporting firefighting operations. As I said, we found people were one of our greatest dangers. This was true not only for the firefighters and curious children who tended to walk into tail rotors unless constantly watched, but also for the firefighting bosses who, through lack of aviation knowledge and experience, requested unnecessary and dangerous missions, and for inexperienced aviators (ouch!) who accepted these missions. Nature's hazards will always be there in the form of trees, weather, high density altitudes and the updrafts and downdrafts created by the mountains and fires. Practice and education can reduce our greatest dangers—inexperience and lack of knowledge.

NO PLAN, NO FUEL, NO PITCH

Fuel exhaustion plus panic, which led pilot to lower instead of pulling collective, caused OH-6A accident

AN OH-6A PILOT and observer were on a visual reconnaissance mission. During the flight, bats flew into the helicopter and knocked out the plexiglass in the upper right quadrant of the cockpit. When they completed the mission, the pilot returned to refuel. He shut the helicopter down and, assisted by a crew chief, examined the damage caused by the bats. Both the pilot and crew chief agreed the OH-6 was not safe to be operationally flown, but could be flown to a maintenance unit for repairs.

The pilot hovered to POL for refueling. When the observer got out to refuel, a soldier at a nearby refueling point began waving at the pilot, indicating there was no fuel. The pilot didn't

question the soldier because there had been problems earlier that day with the POL pumps. He decided to refuel at another base 20 nautical miles southwest. He gave the observer a map of the area and told him to navigate, showing him the general location of their destination. Neither had been there before.

They flew in a westerly direction, out of trim, to keep the wind out of the broken plexiglass on the pilot's side. The fuel gauge registered 100 pounds when they took off. The fuel low warning light and engine-out audio were inoperative. They were flying into a light headwind, at 1,000 feet and 60 knots. Thirty minutes after takeoff, they were about 2 miles north of a point 20 nautical miles to the northeast of their intended destination. The pilot mistook this location for the destination, turned south and began to descend on approach. He leveled off at 400 feet and was flying straight and level when the engine quit. He lowered collective, added right pedal and turned right, heading into the wind. After decelerating, he applied pitch, but was too late. The helicopter hit hard and the right skid broke. The OH-6 bounced into the air and turned right. The pilot, believing he had lost the tail rotor, and apparently in a state of panic, bottomed collective and the helicopter crashed to the ground, nose first. It started rolling to the right over the broken skid, but the pilot applied left cyclic and it rolled on its left side. The observer was killed and the pilot escaped uninjured.

Investigation revealed there was no fuel in any line from the fuel cell to the engine and very little fuel was left in the cell. It was established that engine stoppage resulted from fuel exhaustion.

Findings:

The pilot failed to successfully autorotate after engine failure. He failed to plan ahead and attempted the flight with insufficient fuel. He also used improper procedures for determining fuel capacity and relied purely on the fuel quantity gauge, without considering elapsed time. He did not realize that the out-of-trim condition would cause him to use more fuel. He also relied on an inexperienced observer to navigate with an inadequate map.

Recommendations:

The board recommended that command emphasis be placed on flight planning which is especially critical for single ship missions. It stated that in this case, had the pilot taken the most elementary steps of proper flight planning, this accident would have been prevented. The board further recommended that all aviators be reminded that the safest way of calculating flight time available is by rate of consumption and time, stating that reliance on the fuel gauge alone will not always give a valid fuel status. The board also recommended that all aviators be made aware of the cause factors for this accident.

An indorsing official added these additional cause factors: The pilot failed to seek qualified advice about the airworthiness of the helicopter before attempting further flight. He did not ask about the fuel status where he originally landed and assumed there was no fuel available when, in fact, fuel was available. He also failed to properly account for the 2 hours and 10 minutes he had flown without refueling, and he did not carry the proper maps for his operational area.

Another indorsing official added the following nonrelated supervisory factor: The pilot was not wearing Nomex flight clothing or leather boots, even though these items had been issued to him.

In his analysis, the flight surgeon said the pilot had begun to feel that he might run out of fuel just prior to the accident. He also said that, on his last check ride, his autorotations were not as good as he felt they should have been. This could have led to his being less well prepared for his emergency, due to anxiety. His chin bubble had been broken out, resulting in his being buffeted. This buffeting, plus lack of sleep (he had approximately 3½ hours of sleep the night prior to the crash), may have resulted in fatigue which decreased his coordination and speed of thought. The wind noise and buffeting may also have produced misconceptions about altitude and speed when he flared for landing.

UH-1C AC: "After refueling and hovering to takeoff position, I performed a hover check. Everything was normal. The N_1 was 94 to 95 percent, the torque was 36 to 36½ pounds, the rpm was 6600 and the egt was 560 to 565. At this point I started my takeoff by adding slight forward cyclic. The helicopter went through translational lift and began to climb. The pilot, who was monitoring the instruments, told me the rpm was bleeding off, so I lowered collective slightly. The rpm was 6300 and dropping rapidly. I lowered collective more and began slowing with cyclic. Attempting to put the helicopter down, I saw I could not stop in time to avoid the ditch. At this point, the collective was full down and the rpm was 5600. I pulled in all available collective, but the helicopter struck the ditch and directional control was lost. It spun to the right about 280 degrees, coming to rest on its underside. I turned off the fuel and electrial switches."

Questions asked AC:

"What was your load?"

"Eleven rockets, miniguns and M60s, plus ammunition for the guns and 1,000 pounds of fuel."

"How far did the rpm bleed?"

"When I started losing power, it was down to 6300. I started decreasing collective and pulling the nose back. The rpm had dropped to 5600 by the time we hit."

"Were you on the psp airstrip?"

"No. I try not to take off over psp. You can hang a skid too easily."

"What was your direction of takeoff?"

"East."

"How did the helicopter react after hitting the ditch?"

"The tail turned left, the nose turned right and I ran out of left pedal."

"Was there any change in attitude when the rpm began to bleed?"

"The nose shifted slightly left and I corrected it with right pedal. There were no changes that required more than normal corrections."

"How high were you when the rpm began to bleed?"

"Eight to 10 feet."

"Did you notice any unusual fluctuation of the gauges?"

"Only the rpm. Everything else remained in the green."

Overgross And Into The Ditch

The AC of this UH-1C, which was overgross by 300 pounds, failed to use the data supplied by his go no-go placard and selected a takeoff path over a ditch

The UH-1 hit the ditch on its right skid, rolled left and hit hard, tearing off the left skid, rocket pod and minigun. The force of impact, combined with the application of aft cyclic, allowed the main rotor to flex and sever the tail rotor drive shaft. Rotating to the right, the helicopter assumed a nose high attitude and the tail rotor struck the ground. The UH-1 continued to spin 280 degrees to the right, coming to rest as the left synchronized elevator dug into the ground, tearing off the tail boom just aft of the main attaching splice. The crew chief, who sustained an abrasion and contusion on his leg, was the only one injured.

Investigation board analysis:

"With the load on board, the gross weight at the time of takeoff was 8,207 pounds. According to chart 14-9, TM 55-1520-220-10, dated November 1968, with Change 1, the maximum gross weight for hovering in ground effect with takeoff power available at 35° C. and 3,000 feet pressure altitude is 7,900 pounds. Thus, the takeoff was attempted with the helicopter 300 pounds over the maximum gross weight allowed for the ambient conditions at the time of takeoff.

"The helicopter had 2,500 rounds of 7.62mm door gun ammunition, more than was allowed by the battalion. It should be noted, however, that had these guidelines been followed, the helicopter would still have been over maximum gross weight for the atmospheric conditions.

"Hover check and takeoff power for the helicopter was 94 to 95 percent N_1. The go no-go chart on the instrument panel listed the maximum safe N_1 speed for a maximum performance takeoff, at 35° C., at 92.1 percent. Adding one percent for normal takeoff, the maximum N_1 speed for a normal takeoff was 93.1 percent. The takeoff was attempted in an overgross configuration, using .9 percent more power than recommended for safe flight. Only 2 percent of available power for the engine remained at the AC's disposal.

"During takeoff, the nose of the helicopter was seen to dip just prior to passing through effective translational lift. However, no altitude was lost at that time, indicating that power must have been added. The extra power added would have had to be much more than the engine could deliver and this would have caused the rpm to bleed. At this point, any application of aft cyclic would have taken the helicopter out of effective translational lift, making further flight impossible.

"The route of flight chosen left the AC no alternative but to hit the drainage ditch after he aborted the takeoff. He was unable to turn right because of revetments and he could not go left because of the drainage ditch running parallel to the runway. By using the psp for takeoff, he could have had a prepared surface which would have allowed him to run the helicopter safely on once the takeoff was aborted. While the possibility of catching a skid shoe on the psp was present, it was by no means as certain as landing in the ditch on the takeoff path selected by the AC. . . ."

Board findings:

"Takeoff was attempted with the helicopter loaded beyond allowable maximum gross weight for the ambient conditions and safe flight was impossible. The AC chose a route of flight that would not allow him to safely abort the takeoff once further flight proved impossible. He disregarded helicopter limitations as set forth on the go no-go chart by attempting to take off in an overgross configuration with a power setting at or near maximum available engine output. When further power was required to maintain flight, the engine was unable to produce it, causing rpm, to bleed off.

"The low rpm audio warning circuit breaker was pulled. The unit commander did not ensure installation of a placard indicating total takeoff weight, minus fuel and cargo, as directed by the battalion commander. The unit commander did not ensure that current UH-1C ammunition restrictions, directed by the battalion commander, were followed."

Board recommendations:

"Increased emphasis placed on the installation and use of correct data for the go no-go chart for all UH-1s. Instruction should be given to all pilots, covering the determination of maximum available engine power and maximum power to be used for safe operations and takeoffs.

"Stress to all pilots that high density altitude conditions force them to closely monitor loading of their helicopters. Stress that cargo and fuel loads must be varied to meet load requirements imposed by higher headquarters.

"Remind all pilots of the factors to be considered in the choice of takeoff routes to allow safe aborts.

"The drainage ditch, a hazard to hovering and departing helicopter traffic, should be filled."

AVIATION ACCIDENT PREVENTION FORUM

an interchange of ideas between readers and USAAAVS on subjects of aviation accident prevention

Fuel Samples

I am in an aviation unit where there is a requirement to obtain fuel samples for analysis. I have been unable to find a federal stock number for glass jars to use for the samples, and all attempts to obtain jars have been unsuccessful. Do you have any information about such jars?—Maintenance Officer

The Federal stock number for one-quart glass jars that may be used for fuel samples is FSN-8125-297-1728.

Nomex Flight Suit

In the August 1971 issue of the AVIATION DIGEST, there appeared an article on Nomex repairs titled "Your Wife Won't Do." In bold italics at the beginning of the article was this statement, and I quote, "To maintain the flame retardant qualities and reliability of Nomex flight suits, only authorized materials will suffice." This is great! I'm all for anything that will provide some protection from a fire.

Now let's suppose that I get a rip that is three or four inches long in the lower chest region of my Nomex flight suit. Before, I would have put it in the sewing machine, put a patch behind the rip, stitch back and forth several times to build up a good layer of stitches, and call it a job well done. Now, however, I send it off to a direct support maintenance level for repair. After a short interval, I receive my flight suit back in A-number-1 shape.

As I'm preparing to hang the flight suit up, I admire the neat repair job, pat myself on the back for doing the right thing and say to myself, "This Army is all right." Then my gaze goes higher and there, right before my eyes, is a whole gob of unauthorized material in subdued profusion. Would you believe name tape, US Army tape, wings, rank, branch insignia, and area command patches? All of these items are made from and installed on the flight suit with similar material that is not allowed, according to TM 10-8400-201-23, to be used for repair.

If this material is not satisfactory for repair because it does not have good flame retarding qualities, why is it satisfactory for rank, name tape, etc.?

What is wrong with the leather plate that can be attached to the flight suit with hook and pile fastener tape? I'm sure it is much more fire retardant than the cloth that is presently used.

The following was taken from AR 670-5, paragraph 4-8c, which was published with change 1 on 1 May 1969.

"Wearing of insignia on flight clothing by Army personnel may be prescribed locally by commanders. Type and location of insignia, if prescribed, should conform to placement of insignia on utility uniforms. Alternatively, in lieu of insignia, local commanders may authorize wear of a black leather plate, approximately three inches by two inches in size, with wings and the name and grade of the individual embossed in silver for wear on the flying suit and flying jacket."

Why couldn't this be changed to read, "All insignia and/or tapes on Nomex flight uniforms will have the same fire retardant qualities as the flight suit"?

It is not only my opinion, but that of many other flying personnel, that just as much emphasis should be placed on this area of the flight suit as to repairing it with authorized materials.—CW3

Unfortunately, flame retardant insignia are not available through normal supply channels and unit commanders cannot require enlisted men to wear as part of the uniform an item that cannot be issued to them.

Those who would like the regulation changed as cited can complete and submit a DA Form 2028, requesting that this particular paragraph of AR 670-5 be changed. If required by regulation, flame retardant insignia would soon become part of normal Army supply.

Safety Course

I would like very much to attend the USAAAVS safety officers' course and would appreciate any information you could give me on how to get accepted for this course.—CPT, Aviator

You should apply for the USAAAVS course as you would apply for any school training. USAAAVS sends quotas to all major commands, to Army areas, selected posts, such as Fort Rucker, and the National Guard Bureau. These quotas are then filled with applicants from within these organizations.

Aviator Records

Could you please furnish the flight and mishap records for the aviators listed on the inclosure? This information is needed to determine if these aviators have accumulated sufficient hours without accidents to qualify for safety awards.—CPT, ASO

USAAAVS cannot provide the information requested. Any data pertaining to individual aviators must be requested in a signed document with a command line signature. USAAAVS encourages commanders to review aviator flight and mishap records for accident prevention purposes.

Aviation Safety Program

I am in a newly formed reserve unit in which an aviation safety program must be established. Would you send me the ARs and safety publications necessary for this purpose?—MAJ, USAR

Newly formed reserve units should obtain AR 385-40 and AR 95-5. These provide guidance for establishing aviation safety programs, including preaccident and crash rescue plans, mishap reporting, etc. "Sample Aviation Accident Prevention Program, 1971" and "Guide to Aviation Resources Management for Aircraft Mishap Prevention" may be obtained from USAAAVS. You will find procedures for obtaining publications and blank forms from AG Publication Centers outlined in Forum in the January issue. A list of publications available at USAAAVS was published in Forum in the February issue.

Readers are invited to participate in this forum.
Send your ideas, comments and recommendations to Commanding Officer, USAAAVS, ATTN: E&P Department, Ft. Rucker, AL 36360

PEARL'S *personal equipment & rescue/survival lowdown*

I know *you* would never deliberately damage a piece of equipment, particularly equipment designed to save your life. But some of our less professional associates do just that. This aviator is sitting on his SPH-4 in a manner not uncommon during briefings, bull sessions or hangar flying.

These photographs show the result. The SPH-4 ear cup was not designed to support the weight of an Army aviator. Large numbers of these helmets have been damaged in this way. I know *you'd* never do it, but won't you tell your less thoughtful friends how destructive sitting on their helmets can be? And if you should find your helmet cracked, have it checked by qualified repair personnel.

TWX from CG, USARV, to all USARV company/detachment size aviation units:

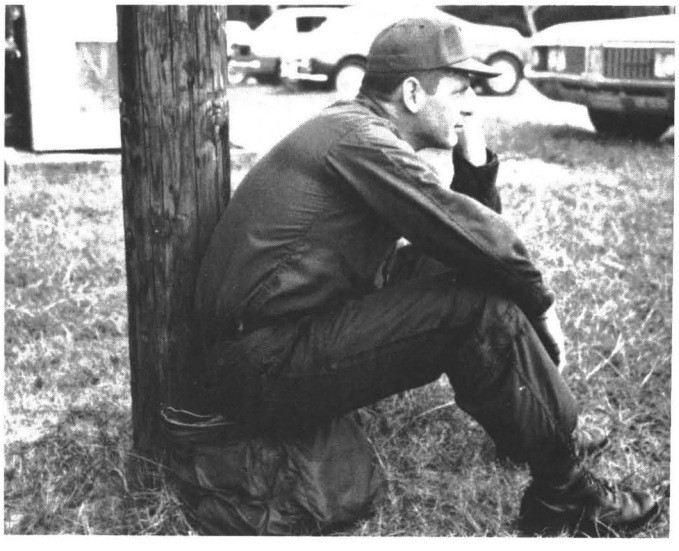
"1. Flight personnel are prohibited from wearing the 100 percent nylon boot sock, FSN 8440-439-2128 (size 7-8½), 2131 (9-10½), 2133 (11-13).

"2. The nylon boot sock will melt at relatively low temperatures and can cause serious and/or permanent burn injuries.

If you have a question about personal equipment or rescue and survival gear, write to Pearl, U. S. Army Agency for Aviation Safety, Ft. Rucker, Alabama 36360

"3. While it is recognized that there is a shortage of the wool stocking (medium), units are encouraged to comply with the intent of this message. [Message stated that wool stockings (Medium) should have been available by 1 December 1971.]

"4. Commanders and unit safety officers should bring this message to the attention of all personnel."



Prepared by an attendee of the
USAAAVS Aviation Accident Prevention Course

THE NEW GUY

I WAS TAKING my boots off, ready to hit the sack after a hard 18-hour day which included almost 10 hours in the air. We'd flown combat assaults all morning and resupply missions and extractions until well after dark. As I dropped a boot, the operations clerk came into the tent with a mission sheet in his hand. The counter-mortar radar had broken down and someone had to fly out to pick up some repairmen and parts. "Why," I groaned, "does this always happen at night!?"

Like it or not, it was an important mission that had to be flown. Our compound had been mortared and several people killed 2 weeks before. Pulling my boots back on, I ran down the list of pilots in my mind. All had flown as much or more than I had during the day and they were all asleep, except for one new guy. As platoon commander, I reluctantly decided it was up to me to take the mission. I told the new guy to get a crew chief and preflight my Huey while I went to operations to get the details.

We were to pick up two radar repairmen at a nearby firebase, then fly on to An Khe for the parts. With the new guy flying as pilot, we were off at 2300, picked up our passengers and headed for An Khe. There was no moon but, thankfully, the weather was clear.

The monsoon season was approaching and we had established a new company policy that every pilot would fly at least 5 hours of hood each month. I decided this would be a good time to practice hood, so we climbed to 4,500 feet and I contacted the local GCA unit for a radar vector to An Khe.

Both the new pilot and I had tactical instrument tickets. I'd had 50 hours of instrument instruction, including 6 hours of AI during training, but I hadn't logged any instrument time in the 14 months since I'd graduated from flight school.

With the new pilot glued to the gauges and flying smoothly, I saw the lights of An Khe about 10 miles ahead. We were turned over to An Khe radar and I started to cancel our radar coverage, but the new pilot was doing a fine job of flying and I decided to let him go ahead with a practice GCA.

Approach control turned us on downwind and everything was looking great when, suddenly, before I knew what was happening, we were IFR for real! I started to take control and turn around, but I knew we were close to some high mountains. It was fairly calm and the pilot was still flying smoothly and relaxed, so I decided our best bet was to continue the GCA. The rotating beacon was reflecting from the cloud, so I turned it off. I was a little concerned, but I didn't want to alarm the crew and passengers.

Approach control turned us on base and cleared us to start a descent. Then it started to rain. The rain grew harder and turbulence began to bounce us around, while lightning flashed. I became more than a little upset. I kept thinking about a close friend who'd flown into a mountain near An Khe. But the pilot still appeared relaxed and competent. He was holding the course and rate of descent well, despite the turbulence.

The turbulence worsened as we turned final and we bobbed around like a loose cork. The controller's voice was still full of confidence and the pilot was holding his own, so I didn't worry—much! When the controller told us to execute a missed approach because he'd lost us because of the electrical activity from the thunderstorm, I just about jumped out of my seat!

The controller told us to continue inbound until station passage, then track outbound on a heading of 70 degrees, as that was the clearest part of his scope at the time. While the pilot was still doing a fine job of flying, I decided, because I was the "experienced" pilot. I should take control. Needless to say, since I hadn't flown instruments in 14 months, I soon had the helicopter going all over the sky. I grew dizzy from vertigo and quickly decided to place our fate back in the hands of the new pilot. He took control and recovered from my wild gyrations. We soon had station passage and he tracked outbound toward the clear area.

It was a wonderful feeling to break out of the clouds and see the lights on the ground. I told the controller we were VFR and he replied, "Roger. Be advised, if approach control is unable to get you down on the next try, I'll have to turn you over to Hammond GCA because the field is going below minimums." I thanked him for his help and told him we'd remain VFR and land at the nearest facility to RON.

Our mission was completed early the next morning under far more favorable conditions and I vowed to practice hood flying at every opportunity from then on. The new guy taught his platoon commander a lesson I'll never forget.

ARMY

THE MOST IMPORTANT MAN

SFC Reginald A. Mullinax
Aircraft Accident Analysis & Investigation Dept.
USAAAVS

GENTLEMEN, the commanding officer!"

Smartly, our group came to attention. We'd heard the new CO was a real stickler for discipline. The word was out that the wrath of the gods could be quickly aroused by courting his disfavor.

"Take your seats!" The deep resonant voice filled the dayroom and it was hard to accept the fact it came from one so small in stature and unimposing in appearance. He was new, having assumed command of the battalion only a week before, and he carried the stigma of the unknown. Yet, as fast as he had inspected the companies, our grapevine was faster. Thirty minutes after he walked into Headquarters and Headquarters Company, he relieved the CO. In Alpha Company, the first sergeant was relieved. At Bravo Company, the maintenance officer and a technical inspector were ousted. Now we, the officers and men of Charlie Company sat in stunned silence, wondering who was going to get the axe today.

"Today, I have seen the most ready company in the battalion." He paused and glared at us. "Unfortunately, I do not mean combat ready! I mean ready to have accidents!" His steel eyes raked over us and he hammered his fist into his palm.

"I've seen the signs in this company that point directly to breakdowns in discipline! I've seen haircuts that exceed the limits prescribed by regulation! I've seen messy uniforms and officers and enlisted men smoking in and around helicopters! I've seen personnel backing wreckers between helicopters without ground guides! I've seen mechanics installing a tail rotor with a torque wrench that was dropped on the work platform!"

He paused again and his voice lowered, "What should I do? I could relieve a few people and administer article 15's, or I might be able to make a court martial stick on grounds of dereliction of duty." He shook his head and continued, "However, I have a surprise for you. The most important man in the Army aviation safety program is currently assigned to Charlie Company and he's watching all of you for me. I'll not tell you whether he's an officer, a warrant or an enlisted man. But let me assure you, he is assigned!"

A sudden hush filled the dayroom as we sneaked furtive glances at each other. What was this? Since when did we have spies assigned to watch an outfit? Who the devil could it be?

"In closing," the colonel continued, "let me tell you about an old pilot I once knew who had been flying since 1909 and claimed to have received his flight instruction from the Wright brothers. At the time I knew him, he was over 70 years old and still flying. I asked him how he could explain living so long in an occupation which is considered hazardous even today. Looking me in the eye, he said, 'I have never demanded more from any airplane than I had to have and I've never had to ask more from an airplane than it could give!'

"That old pilot learned early in his career that disciplined flying is safe flying. What do we mean by discipline? Discipline is doing what you are required to do, when you are required to do it, in the manner in which it is required to be done. I shall demand disciplined flying from all of you!"

Once again, we snapped to attention as the colonel stepped from the stage and marched briskly out of the dayroom. I guess I don't need to tell you about the comments that were made after he left. There were statements like, "Lifer!" and "Back to the brown shoe Army!" Our new CO had come on strong and he had a reputation for not saying things he didn't mean. I think that what really had everyone rattled was the idea of a spy from the safety program being assigned to Charlie Company. We were a tight little group. We worked good together and our accidents weren't all that bad. Oh, we'd had more than our

share, but we flew a lot of hours on some pretty tough missions.

You could almost feel the difference in the company after that meeting. It was as if we didn't trust each other because no one knew who the spy was. But I'll have to admit that things improved. Salutes became a lot snappier and haircuts came back within prescribed limits. Uniforms seemed to have sharper creases and not so many grease spots. I even saw some spit-shined boots among the older men. Eventually, I started to feel esprit de corps forming from an attitude that seemed to say, "We'll teach them to send a spy to Charlie Company!"

When I started a helicopter, someone would appear out of nowhere with a fire bottle—not a little one, but the big rollaround jobs we're supposed to use. One wrecker driver got the worst chewing out I ever heard for leaving a transmission assembly suspended on the hook while he took a smoke break. The operations officer and the weather detachment started giving briefings that were really briefings. If maintenance said operations could only have five aircraft when they asked for six, there weren't any arguments.

Then it happened and, of all people, it had to be me it happened to. I had a date Friday night with one of the most beautiful girls you can imagine. In fact, I'd had the ring in my pocket for a week and meant to ask her to marry me that night. The weather was bad that morning and we hadn't been able to get off the ground. Then, about noon, the sun burst through and I drew a mission. I tried to talk the operations officer into sending someone else, but it seems the passengers I was to fly had flown with me before and asked for me.

Well, no sweat. I had plenty of time to make it before my date. That is, until we got the chip detector light on final at our destination. The crew chief checked the plug after we landed and there were some fine metal flakes on it. Not a lot, but it was more than normal fuzz. That's where I contacted get-home-itis. I knew better, but everything was all set for my big date—reservations at the club, our favorite band and the ring. The crew chief didn't like it but I was AC and I decided we would return to home base.

Twenty minutes after takeoff, we got another chip light, but this time it was followed by the weird silence of total engine failure. There just wasn't time to find a place to put it down, so into the trees we went. I remember thinking this kind of thing only happens to other pilots—not to me!

Fortunately, I was the only one to get hurt and I'm thankful for that. The accident investigation board said that if it hadn't been for the crashworthy fuel system, we probably would have burned and that would have finished me. I was caught by the left leg and couldn't get out until the crew chief and copilot bent the airframe away from my broken leg.

I've had lots of visitors here at the hospital, my ex-girl for one. She came to tell me she was going to use the date that night to let me know she was marrying someone else. Of course, my buddies and the company CO have been in. Then, one afternoon, the colonel came to give me the axe.

I felt sure I'd have to face an FEB, but I had a surprise for the old man. "Good afternoon, sir," I said. "Guess I pulled a no-no, didn't I?"

"Yes, mister, I guess you did. How's the leg?"

"Sir, my leg is going to be okay. But, more important, I'm going to be a different man and a better pilot from now on. You see," I continued, "I know who the most important man is—the spy you sent in on us. I feel stupid for not figuring it out long ago."

"Go ahead," he said. "Tell me who he is."

"Okay, sir," I started. "It's me and every other individual in the outfit. It wasn't any outsider at all and it wasn't really any one person. It's everyone who works around or in aviation, because they're the ones who prevent accidents. I don't care how much data you gather or how much research is done, it's still the guy who makes it, fixes it, services it, schedules it or flys it who causes mishaps that turn people into statistics, and every single man who does his job right is the most important man in aviation safety. Right, sir?"

He didn't answer with a yes or no. He just looked at me and said, "Mister, you came a long way up by going down." Then, can you believe it? He shook my hand and smiled. The old man actually smiled.

This article was written by the author while attending the Aviation Accident Prevention Course at USAAAVS

CW2 William R. Murphy

SITUATION NO.1: It was 0600 on a dark, rainy morning in RVN. As the UH-1D hovered out of its revetment, the crew chief asked the pilot to put it down on the taxiway for a moment so he and the gunner could pick up some seat cushions. The helicopter was lowered to the rough, wet surface, and the crew chief and gunner scurried after their cushions.

It was company policy to reduce rpm to flight idle if a UH-1 had to wait more than a moment or two on the ground. This particular helicopter had a tendency for the left pedal to creep in, but no noticeable force was required to overcome this movement.

The pilot, in the right seat, had flown up to this point. After a minute or two, the AC, in the left seat, reached down and rolled the throttle to flight idle. It was a quick movement, followed immediately by a violent yaw to the left. Both pilots grabbed for the controls and the helicopter stopped after turning about 45 degrees.

What happened? The pilot had removed his feet from the pedals and the left pedal had crept in. When the AC chopped the throttle, the loss of torque, coupled with the wet surface, caused the helicopter to yaw to the left. Fortunately, there were no injuries and no damage.

Situation No. 2: A CH-47 was hot refueling. The crew chief and gunner were handling the hoses, while the supervising flight engineer was standing to the rear of the helicopter, with the ramp down. The AC was filling out his mission sheet and the pilot was holding the controls. The pilot released his grip on the cyclic, with his attention directed inside the cockpit. Suddenly, both pilots felt a strange sensation and looked up. The CH-47 had assumed an extreme nose low attitude and the cyclic stick was at its extreme forward limit.

Both pilots grabbed the cyclic and yanked it aft in an attempt to level the helicopter. They did so with such force that the aft gear and ramp struck the ground violently, resulting in severe structural damage and a major accident. The control centering switch was off.

Situation No. 3: A CH-47 was in level flight at 3,000 feet. After establishing a cruise power setting, the AC placed his left hand on the window frame. Unlike most helicopters, the CH-47 has no friction adjustments for the pilot. The thrust lever is held in place by a magnetic brake which the pilot controls by a trigger switch in the overhead panel. This circuit is protected by a circuit breaker in the overhead panel.

At the moment the AC placed his hand on the window frame, the circuit breaker popped, probably through a surge in the electrical system, and the thrust lever fell to the floor.

The helicopter gave a violent shudder, N_2 rpm increased and everyone was momentarily weightless. An unsecured toolbox in the cabin area left the floor and flew into a bulkhead. A smooth recovery was made by a surprised and visably shaken AC and no damage resulted. The circuit breaker was reset and the flight continued.

What ties all these situations together? The pilot who was supposed to have control—*did not!* The cause? Carelessness—complacency—loss of respect for the helicopter and what it can do if not kept under positive control at all times.

The remedy? Close supervision—standardization—and a conscious effort on the part of all crews to remain alert and aware of the limits and tendencies of their aircraft.

Spring Fashions

AS ARMY aviation prepares for spring, pace setters in the fashion field will apply a mixture of old and new in developing styles for the new season. Patterns of the past will be evident, as the trend toward individualism continues. Let's take a sneak preview of things to expect:

Personnel—Watch for a wide array of ornaments on fatigue hats. The most popular items will continue to be paper clips, various emblems and embroidered names, with miniature flags making significant gains.

Beautiful beads and necklaces with a wide variety of symbolic emblems will adorn the necks. More sunglasses will be worn on shirt lapels and-long-handled combs will protrude from back pockets.

Another line of fast selling items showing great promise is undergarments and socks made of nylon and other heat melting synthetics. Gloves will again be optional and jungle boots, the ones with an abundance of nylon inserts, will adorn the feet of the truly chic. Helmets will feature puncture-producing gladiator adornments and be worn in the casual continental manner, with chin straps dangling.

Aircraft—Few changes in fashion are expected. The emphasis will be on improving current styles. Foreign objects are expected to retain their popularity. Rags, bottles, cans, magazines, ammunition, tools and similar items will give avionic compartments that homey, lived-in look. Unsecured toolboxes, luggage and other large items will lend a similar look to cargo compartments.

As in the past, survival gear is out and passen-

Major Roy P. Hooks

Education and Prevention Department
USAAAVS

gers and crews will not be subjected to the constricting restraint of fastened seatbelts.

Some of the sportier models will be seen wearing refueling hose without grounding attachments. During the gala party season, when stuffing is in order, with its inevitable overweight problems, many aircraft will be forced to don new engines, transmissions and other components. Cowlings, when worn, will feature the casual look of loose fasteners. Protective covers will not be worn for nightwear or weather activities.

Facilities—The sloppy look will again be in vogue, as spillages and trash remain unpoliced. Approaches and overruns will feature tall grass to hide unsightly ditches and holes. Excess and unauthorized equipment will add to the sloppy look.

Overloaded electrical circuits and unauthorized cleaning materials, both popular for many years, will again be plentiful. Other items which haven't sold well in the past will again be available. Hover/taxi lanes, vehicular traffic routes, speed limits and designated smoking areas are not expected to sell any better than they have in previous seasons.

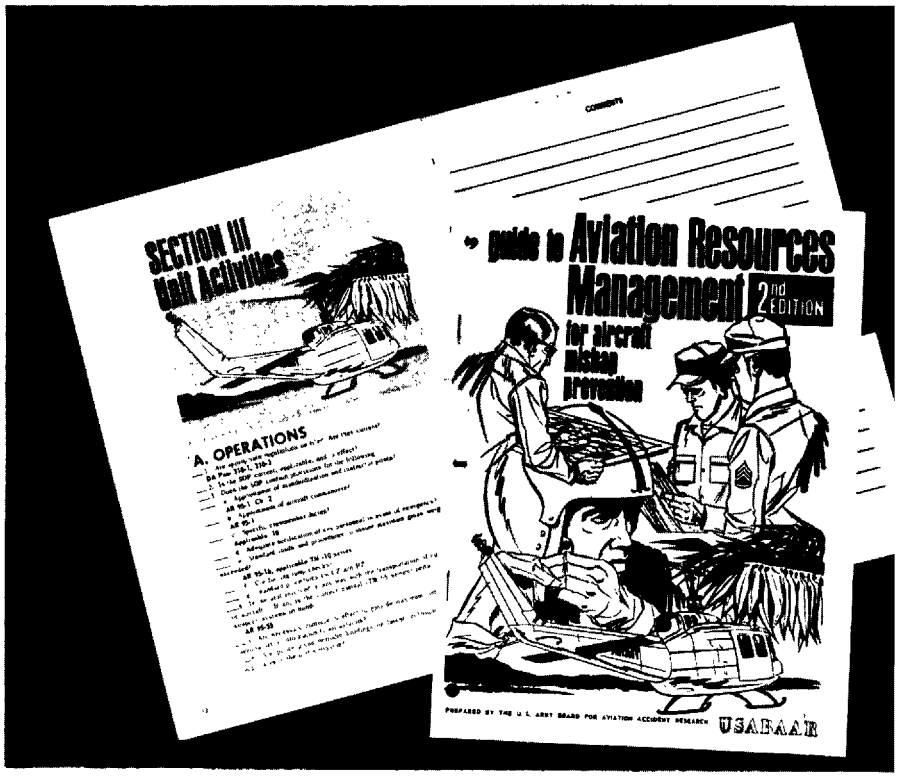
These fashions and others like them develop from ignorance, disregard or, in some cases, defiance of policies and regulations. The significance of this is that our aviation accident prevention program is based on policies and regulations.

Without getting philosophical, let's just say that allowing violations of one policy or regulation sets the stage for the violation of others. Simply stated, this amounts to a breakdown in discipline and performance, the ideal atmosphere for producing accidents.

One effective method for your unit to avoid undesirable fashions this spring and in the future is the

ACCIDENT BRIEF: During initial takeoff, the aircraft yawed slightly to right and, immediately thereafter, the main rotor blades contacted the ground, resulting in major damage. The aircraft was parked in proximity to a refueling grounding stake. The metal stake was a copper alloy rod, approximately five-eighths inch in diameter. It was driven into the ground, with 1½ inches protruding above the ground. During liftoff, the right skid contacted the stake, causing the helicopter to stop, then pivot around the stake. The sudden stoppage sheared the rivets on the skid bracket, allowing the fuselage to be displaced to the right of center of the cross tubes. This caused the helicopter to start rolling on its right side.

ACCIDENT BRIEF: The psp runway surface was still wet and slippery from a recent shower. The aircraft touched down about one-third of the way up the runway and began to slide when



Certain tools are needed to conduct an effective survey. One of the most valuable is the USAAAVS Guide to Aviation Resources Management for Aircraft Mishap prevention

brakes were applied. With approximately 250 feet of runway left, while still sliding, the aircraft commander elected to make a go-around. He was able to get the aircraft airborne again, but the left landing gear impacted a bunker in the overrun area, causing the aircraft to crash and sustain major damage. The same bunker had been a cause factor in two other aircraft mishaps.

Why did these accidents occur? In each case, an existing potential cause factor had not been recognized as a hazard. Consequently, action was not taken to eliminate it. To say that we must eliminate existing hazards and take appropriate action to preclude new ones, if we are to have an effective accident prevention program, is axiomatic. How do we accomplish this? One necessary step in the process is the aircraft accident prevention survey. It is one of the most effective means of producing a detailed analysis of current conditions and monitoring a unit's aviation safety program. The aircraft accident prevention survey is designed to isolate potential aviation hazards in facilities, equipment and personnel. Organization and planning are vital to a successful survey and these are the main points I will address. For a better understanding of these points, let's first review the concept of aircraft accident prevention surveys, as outlined in AR 95-5:

The survey should be a revolving project. Just how detailed and how often it should be made will vary in individual cases. In some units, it may be desirable to conduct a complete survey at specified intervals, quarterly or semiannually, for example. Other commanders may find it desirable to survey one or more functional areas each month so that a complete survey will be accomplished at specified intervals. In either case, it may be beneficial to conduct a particular phase of the survey more often than others.

One survey will only disclose the potential problem areas of the moment. Followup surveys must be made to ensure that corrective actions are taken on recommendations made from previous surveys, and that no new potential problem areas have developed since the last survey.

In discussing the techniques of conducting a survey, let's consider these areas:

Survey Tools
Survey Team
Planning the Survey
Conduct of the Survey
Survey Report

Certain tools are needed to conduct an effective survey. The following are most valuable: USAAAVS Guide to Aviation Resources Management for Aircraft Mishap Prevention (hereafter referred to as the Guide). This booklet is prepared

by USAAAVS and updated annually. It is organized into five sections and further subdivided into functional areas, where appropriate, in the form of checklists. Most checklist items give appropriate references. While it is comprehensive in scope, it is general in nature since it is designed to apply to all Army aviation activities. Therefore, it will be necessary to have—

Locally prepared supplements must include specific areas and items peculiar to each unit's environmental and operational situation. They must take into full consideration the policies and procedures of intermediate headquarters, as well as Department of the Army publications. It will enhance their use if local supplements are prepared as annexes to the Guide—

Reports of previous surveys will reveal past problem areas and recommendations. Perhaps more important, in conjunction with the current survey findings, they will reflect the command emphasis given the unit safety program—

Reference file: Section V of the Guide is a consolidated listing of all publications used in preparing checklist items. Locally prepared supplements should also include appropriate references. While it may not be necessary to maintain a separate file of publications for survey purposes, all reference material must be available and current.

Next, let's take a look at the survey team, its composition and qualifications. The size of the team is naturally going to vary with the size and scope of activities of the unit to be surveyed. The team must be large enough to ensure a timely, orderly and comprehensive survey. It should be composed of personnel qualified to evaluate its assigned areas. It's desirable for team members to have had training and/or experience in their assigned areas. It may be necessary to obtain members from another unit to ensure desired qualifications. Such "unjaundiced" eyes can provide excellent balance to the team. It's also wise to appoint one or two inexperienced members. In addition to receiving the benefit of their fresh inquisitiveness, you will be developing trained personnel for future surveys.

Now, by applying a few basic planning steps to what we have discussed, we'll be ready to conduct our survey. After selecting our team members, we should organize the team by dividing it into subteams for each functional area we are going to survey. A subteam may have responsibility for more than one functional area. Subteam leaders must then assign individual responsibilities. This includes assigning specific checklist items to each team member.

We should next brief the team on the use of the Guide and locally prepared supplement; the organization of the unit to be surveyed and its mission; and administrative matters, such as uniforms, equipment and coordination meetings during the survey.

The next and perhaps most important step in the planning phase is individual preparation. Team members must study the reference material for their checklist items and general functional areas. It is not necessary to know the reference material verbatim. Rather, team members should be familiar with the material and know where to find specific references.

Finally, the team chief must make the necessary liaison, including arrangements for entrance briefings, guides, billeting, transportation and exit briefings.

We're now ready to conduct our survey. Basically, this amounts to observing normal operations, reviewing established policies and procedures, inspecting equipment and facilities and analyzing management. But wait! There's an important phrase in that statement—*normal operations*. When folks know they're being observed, they may not perform as they normally do. For this reason, it's desirable for team members to be inconspicuous and avoid undue interruptions of ordinary operations to evaluate the unit in its proper perspective. At the same time, it's necessary to take notes and/or tape recordings of findings and it's most beneficial to photograph certain findings, both good and bad. Now, what could be more conspicuous than an agent with notebook and pen in hand, and with cameras and tape recorders slung over his shoulders? The best solution lies in technique. Perform your task in a low-key manner. Try to blend in with unit personnel and do not engage in arguments.

Once the survey is completed, the team has two important tasks to accomplish. These are the exit briefing and written report. If ever you are going to tell it like it is, do it during the briefing. Don't paint a rosy picture for a commander and then rip him apart in the written report. The exit briefing should be a concise summary of findings by functional areas. Specific mention should be made of outstandingly good or bad findings and all findings with high potential cause factors should be clearly stated.

The format of the written report is not so important as long as it promotes unity and coherence. It is most important, however, that the principles of effective writing be adhered to in recording the findings and recommendations. Of

special importance are accuracy, brevity, completeness and clarity. When the art of circumlocution is employed to alleviate the pain of truth, the main point usually becomes obscured.

A fully completed, recorded and filed survey adds little, if anything, to the accident prevention effort. It merely awakens a commander to an awareness of potential problem areas within his unit. The benefits are derived from taking timely and appropriate corrective actions based on the findings. If the survey is used with this in mind, it will serve as a foundation for an effective accident prevention phase of your aviation safety program.

RIDE 'EM COWBOY!

This article was written by the author while attending the Aviation Accident Prevention Course at USAAAVS

First Lieutenant John E. Hurley Jr.

WE'VE ALL heard and read about pilots *cowboying* aircraft—such things as unauthorized aerobatics, unnecessary low flying (buzzing), downwind takeoffs and landings and other unsafe practices. The term *cowboy* brings to mind a story I once heard about the Cisco Kid and his sidekick, Pancho. Outside the local cantina, Pancho saw Cisco walking up the street with his hands cupped together.

"Hey, Cisco, what have you got?"

"Ah, Pancho, I have the butterfly."

"What you do with the butterfly?"

"I'm going to get some butter."

"Cisco, you can't get butter from the butterfly!"

Cisco smiled and continued on his way. In a few minutes, he returned with a pail of freshly churned butter.

Later, Pancho again saw Cisco walking up the street with his hands cupped together.

"Hey, Cisco, what have you got?"

"Ah, Pancho, I have the horsefly."

"What you do with the horsefly?"

"I'm going to get some horses."

"Cisco, you can't get horses from the horsefly!"

Cisco smiled again and strode away. In a few minutes he returned, leading two fine horses. When he had tethered the horses, he approached the cantina with cupped hands.

"Hey, Cisco, what have you got this time?"

"Ah, Pancho, I have the barfly," Cisco replied, marching through the swinging doors.

"Wait, Cisco! I go with you!"

How many times have you taken off overgross and come back with the butter? How many Cobra pilots have gotten away with hammerhead stalls? How many times have you gone out and lit the fire without even glancing at the checklist?

As an Army aviator, what you have in your cupped hands are the lives of your passengers and crew, plus an expensive aircraft. The next time you're tempted to *cowboy*, remember Cisco and Pancho. If you're going after horses, make sure you don't catch a jackass!

OUT OF THE ENVELOPE

AN OH-6A AC and observer took off at 0630 for an armed aerial perimeter check of a fire support base. An AH-1G was giving cover about 750 feet above.

OH-6 AC: "We were making clockwise rotations around the fire base. The Cobra pilot requested me to drop down lower on the slope and check for recent activity. The sun was starting to bother me and I pulled my visor up and away from my face. There was little wind and my ship was operating normally, with all gauges in the green.

"As I approached the northern slope of the horseshoe, we were about 50 feet above the ground at 60 knots. As we were making a 60-degree break to the left to follow the slope, we started losing altitude. I pulled in some power, but that didn't help. We kept settling. I pulled aft cyclic, hoping to flare and reach the road at the bottom of the mountain. But we kept falling through. I looked back and saw the helicopter was burning. I don't know if we had hit the ground before that time or not."

Questions asked AC:

"Were all of your gauges working properly at the time of the accident?"

"Yes, I had flown the helicopter for the last 3 days and it was a good flying ship."

"Did you turn down the ridgeline or fly over it?"

"I flew along the perimeter and ridgeline the first time. During the second pass, we dropped about 100-150 feet down the ridgeline. Everything started happening about three-fourths of the way through the second pass."

"Is there anything you would like to add?"

In response to this question, the AC explained that after the helicopter hit, it tumbled end over end and was on fire. He was still in it and had to hit his seat release with his pistol to get out. After rolling himself on the ground to put the fire out, he returned to search for the observer, but was unable to find him. He also explained that he had no time for radio calls because everything happened so fast.

The observer was killed and the AC sustained serious burn injuries.

Investigation board analysis:

"Due to the load, low air speed (60 knots) and altitude (50 feet), the steep bank (60°-75°) attempted by the AC placed the helicopter in a critical flight attitude. The AC further complicated this critical situation by applying collective and initiating a flare."

Listed as cause factors were the AC's attempt to bank 60 degrees to 75 degrees, too steep for the low air speed and altitude at which he was flying; the fact that the AC had not been given sufficient flight time in the operational area before he was released for solo; and the fact that he was flying directly into the early morning sun.

The observer was wearing an improperly fitted flight helmet which he lost in the crash, and it was suspected that the loss of the helmet contributed to his death. Due to the intense heat of the fire and unconscious state of the observer, the injured AC could not rescue him.

The board recommended that all pilots should be made aware of the critical operating limitations of the OH-6A under induced loads, and that all pilots receive sufficient training in their operational areas.

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

Alternate airfield radar procedures
Terminal control areas
Runway identification

Alternate Airfield Authority - Radar Procedures: Did you ever arrive at homefield expecting a radar approach because of bad weather and be advised that radar is out of service? Compound this with loss of communications and panic prevails. Let this occur at the alternate and disaster may ensue. It is planned to revise AR 95-2 to require an alternate airport any time that radar is the sole approach aid at the destination. The revision will also prevent the selection of an alternate airfield when one is required based solely on radar service and minimums there. In the meantime Army radar procedures are being revised to contain the symbol A-NA when the procedure is amended for any other reason. Radar procedures are dependent on air to ground - ground to air - power source - mechanical failure, duty status of operators, etc., all subject to degrees of unreliability. Present lost comm rules and procedures and the reliability of common simple Navaid systems assure realistic probability of mission accomplishment. Happiness is always having an (alternate) out in any unsafe situation.

Terminal Control Area (TCA) Operation: As you know, a terminal control area (TCA) consists of controlled airspace extending upward from the surface or higher to specified altitudes within which ALL AIRCRAFT are subject to operating rules and pilot and equipment requirements specified in Part 91 of the Federal Aviation Regulations. You are probably also aware that, regardless of weather conditions of whether the pilot is on an IFR or VFR flight plan an ATC clearance is required prior to operating within a TCA. Here's a little tip for pilots who are not familiar with how requests for ATC clearances to operate within a TCA are handled. During your initial contact with the TCA controller, be specific as to the altitude and routing you desire. Much like when filing a flight plan with an FAA flight service station (FSS) or an air route traffic control center (ARTCC), every effort will be made by the TCA controller to issue an ATC clearance as requested or, in the event of traffic, an ATC clearance as close as possible to that requested. Example, "R-12345 is requesting 4,500 feet to Linden Airport from over Deer Park via the Deer Park VORTAC 280 radial to Flushing direct Verrazano Bridge direct Linden Airport." Failure to be specific (example, "R-12345 is requesting ATC clearance to Linden Airport from over Deer Park") leaves your altitude and routing entirely up to the TCA controller to determine. Although the TCA controller normally will issue a clearance to your destination via the most expeditious route, it is possible that he may place you in a traffic flow pattern with an undesirable circuitous routing. Why leave your ATC clearance and routing to chance—besides you may be able to save yourself a lot of time and gasoline.

Runway Identification: U. S. National Standards and U. S. Army Standards require that each runway end shall be designated by numbers and by letters where required. Numbers and letters assigned shall be determined from the approach direction and shall conform to the form and dimensions shown in Engineer TM 5-823-4. The number assigned shall be the whole number nearest one-tenth the magnetic azimuth of the centerline of the runway measured clockwise from magnetic north. Single digits shall not be preceded by a zero. This U. S. national system for assignment of runway numbers is carried out in approach procedure, SID, airport sketch and related FLIP ATC media. Attention to this detail in NOTAM, supplements, training, DOD FLIP change notice to USAASO and other pilot usage contributes to the high standards of professionalism desired.

CORRECTION: In our December "USAASO SEZ" item on AR 95-37, we suggested that ATC chiefs should take particular notice of paragraph 1-56. It should have read 1-5-b.

TORNADO

AT ABOUT 0110 hours on 13 January 1972 a devastating tornado claimed four lives and destroyed more than 70 mobile homes in two trailer parks in an area between the U. S. Army Aviation Center at Ft. Rucker, AL, and the city of Enterprise. The same twister demolished nine helicopters but caused only minor injuries at nearby Lowe Army Heliport.

Within 45 minutes three Army air rescue UH-1 helicopters were on the scene at the trailer parks to render immediate aid. "Flatiron One" (rescue call sign) landed while "Two" and "Three" circled onstation and searched for victims and signs of damage with their landing lights.

A few hours later authorities at Lyster Army Hospital, Ft. Rucker, called upon Flatiron to air evac a seriously injured victim to Columbus, GA. The entire area, locally and to Columbus, was still under alert for tornados, 3/4 inch hail and wind gusts up to 60 knots. Locally there were cumulo-nimbus east through south, moving northeast. Additionally, the tornado had left the area on a track of 030 degrees—the proposed flight path. The medical authorities insisted that if there were any possible way the patient should be air evacuated.

Along with its medic, Flatiron Three departed the hospital helipad with a flight surgeon due to the severity of the victim's injury. The first part of the emergency flight occurred in severe turbulence, but because of RAPCON tracking the flight encountered no hail nor damaging turbulence though lightning flashed alternately on either side of the helicopter.

Near Columbus Flatiron Three was cleared for an ILS and broke out of the 1,500 foot overcast inbound from the outer marker. The pilot made a sharp turn and landed on the Columbus Medical Center rooftop.

Shortly after dawn the same morning a U-21 Ute made an emergency flight to the Birmingham, AL, airport with two critically injured victims. This flight was cleared direct by air traffic control and arrived at the destination within 45 minutes. The U-21 received RAPCON radar tracking as did the Flatiron flight. Both crews had high praise for the RAPCON people.

During the day additional UH-1s from Ft. Rucker made visual reconnaissance flights along the path of the tornado.

Both of the men appearing on the front and back covers are civilians who are supporting Army aviation as enlisted men in the Army National Guard. The man on the left (front and back) is SP5 Charles R. Matthews Jr., Aviation Augment, 146th Signal Battalion, Florida Army National Guard; in civilian life he is the baseball coach and head of the physical education department of Jacksonville High School, Jacksonville, FL. The other man is SP5 Robert A. Gordon Jr., a turbine engine repairman with the 107th Transportation Company, 31st Aviation Battalion, Alabama National Guard; as a civilian he is administrative assistant of the Alabama Forest Products Association in Montgomery, AL. As these men have learned, opportunities in the Guard and Reserve are plentiful. If your tour in the Army is up, write the DIGEST today for a list of Army aviation units near your home.