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UNITED STATES ARMY FEBRUARY 1972

AVIATION DIGEST

UNITED STATES ARMY AVIATION DIGEST

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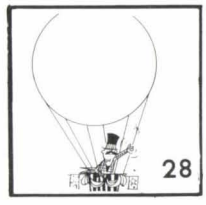

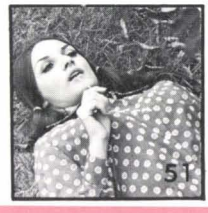

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ABOUT THE COVER

Valentine's Day is one of life's pleasures; so is your hearing. In behalf of the DIGEST staff, our cover girl—Judy Classen—wishes you a happy day and asks that you take the articles on pages 14 and 15 to heart. Thanks to CPT Tom Greene for the cover

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.

Use of funds for printing this publication has been approved by Headquarters, Department of the Army, 1 October 1970.

Active Army units receive distribution under the pinpoint distribution system as outlined in AR 310-1. Complete DA Form 12-4 and send directly to CO, AG Publications Center, 2800 Eastern Boulevard, Baltimore, Md. 21220. For any change in distribution requirements, initiate a revised DA Form 12-4.

National Guard and Army Reserve units under pinpoint distribution also should submit DA Form 12-4. Other National Guard units should submit requests through their state adjutants general.

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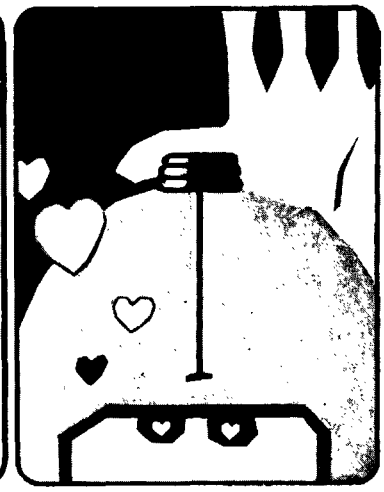
VIEWS FROM READERS



Sir:

1. Please change the Air Force portion of the procedures for acquiring the DIGEST to read:

Air Force and AF auxiliary elements:

HQ USAF states that funds have not been programmed for Air Force utilization of the Army Aviation Digest. Local funds must be used for paid subscriptions with the Superintendent of Documents (see below).

2. Please discontinue any distribution you are now making to Air Force addressees and refer future requesters as in paragraph 1 above. We are making a general announcement to Air Force activities advising them of this action.

LTC James S. Love
Directorate of Administration
HQ USAF
WASH DC 20330

• **This change, as well as others, is incorporated in the item "Looking for the Digest" on page 20 of this issue.**

Sir:

Attached is a brief item on our Department of Defense sponsored Maintenance Management Orientation Course. We would appreciate inclusion of this item in your excellent publication to assist in making the availability of this course known to as many people as possible.

COL Crocker
Dean, School of Systems and Logistics
Wright-Patterson AFB, OH 45433

MAINTENANCE MANAGEMENT ORIENTATION

Maintenance of equipment in military organizations is rapidly becoming recognized as a keystone to the total ability of the organization to meet its mission requirements. Normally, the maintenance element is managed by an individual designated for the task but it is becoming more and more important that the commander and senior nonmaintenance staff personnel understand what problems that maintenance manager faces. They can learn some of those problems through personal contact and observation when they can make available the necessary time from their own jobs and responsibilities. However, that is a slow process and may, for that reason, be discouraging.

Another means exists in a short course of instruction conducted for the Department of Defense by the Air Force Institute of Technology, School of Systems and Logistics, Wright-Patterson AFB, Ohio. The one-week Maintenance Management Orientation Course (242) is specifically designed to provide a meaningful orientation to equipment maintenance for senior military and civilian personnel who are not maintenance managers. The five class days provide coverage of maintenance policies and concepts in the Department of Defense and participative involvement of the class members through discussion and simulation. Current maintenance problems, their likely causes, and possible accommodations to them are introduced for consideration relative to their effect on unit mission ability and/or unit economy of resource utilization.

The course is for military and civilian personnel of all agencies of the Department of Defense. Criteria for attendance is established at the 0-5/0-6 level for military and the GS-13/GS-14/GS-15 level for civil service, although requests for waivers based upon job and need will be entertained. The program is outlined in detail, as are application instructions, in DOD Catalog 5010.16C, Defense Management Education and Training, available in training offices.

Sir:

Would you please clarify the rules for a standard instrument qualified aviator logging IP time while flying with another aviator who is logging "hood" time. I prefer to do as stated in paragraph 3-18 (3) of AR 95-1 dated 12 Sep 69. Does an aviator have to be on instrument pilot orders to log IP time?

CPT Gary L. McClendon
345th Avn Det
APO 96215

• **When an individual has a standard instrument qualification, he is qualified to instruct instrument flying, however, as per AR 95-1 para 2-3 dated 12 Sep 69 he must be specifically designated on official orders as an instructor pilot to log IP time.**

Sir:

I have recently been affected by the present cutback in the active duty Army and therefore am considering joining a Guard or Reserve unit in my area having any need for pilots.

Continued on page 35

When you are flying, a mad bull can't touch you, but if an improper preflight puts you down in his pasture its . . .

McNair

ANNUAL AWARD
Monthly Winner
CONTEST

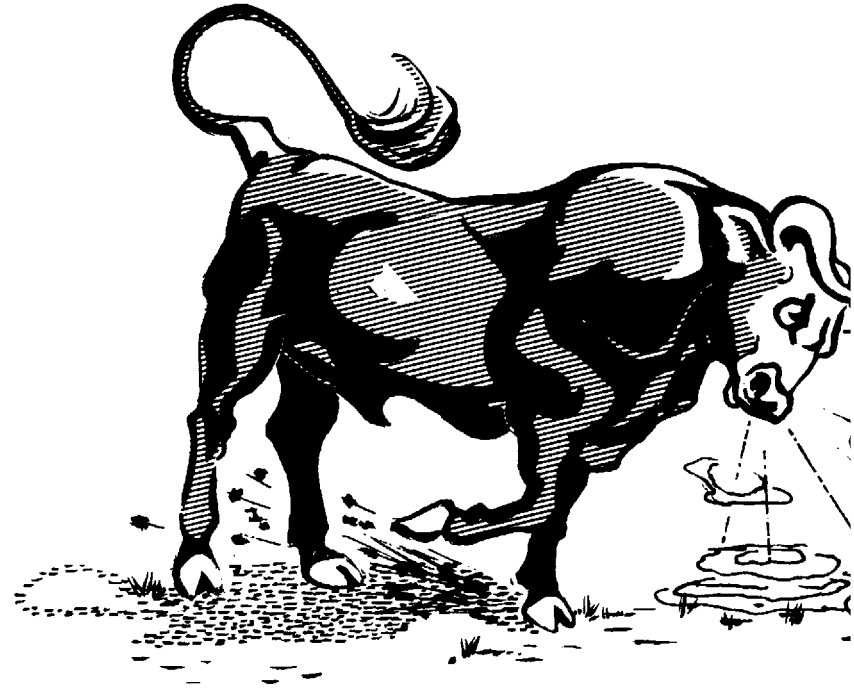
Lieutenant Colonel Carl H. McNair Jr.

IT WAS ON A COLD and windy January Texas morning when I learned my most important lesson about flying—that almost all accidents start on the ground before the flight even begins. I was a young and eager Army aviator with nearly 1,500 hours and 5 years of flying experience in fixed wing aircraft from small L-4 Cubs up to C-47s. My flights had ranged from small sod fields in the remote areas of Taiwan to long overwater international flights into places such as Tokyo, Hong Kong and Manila.

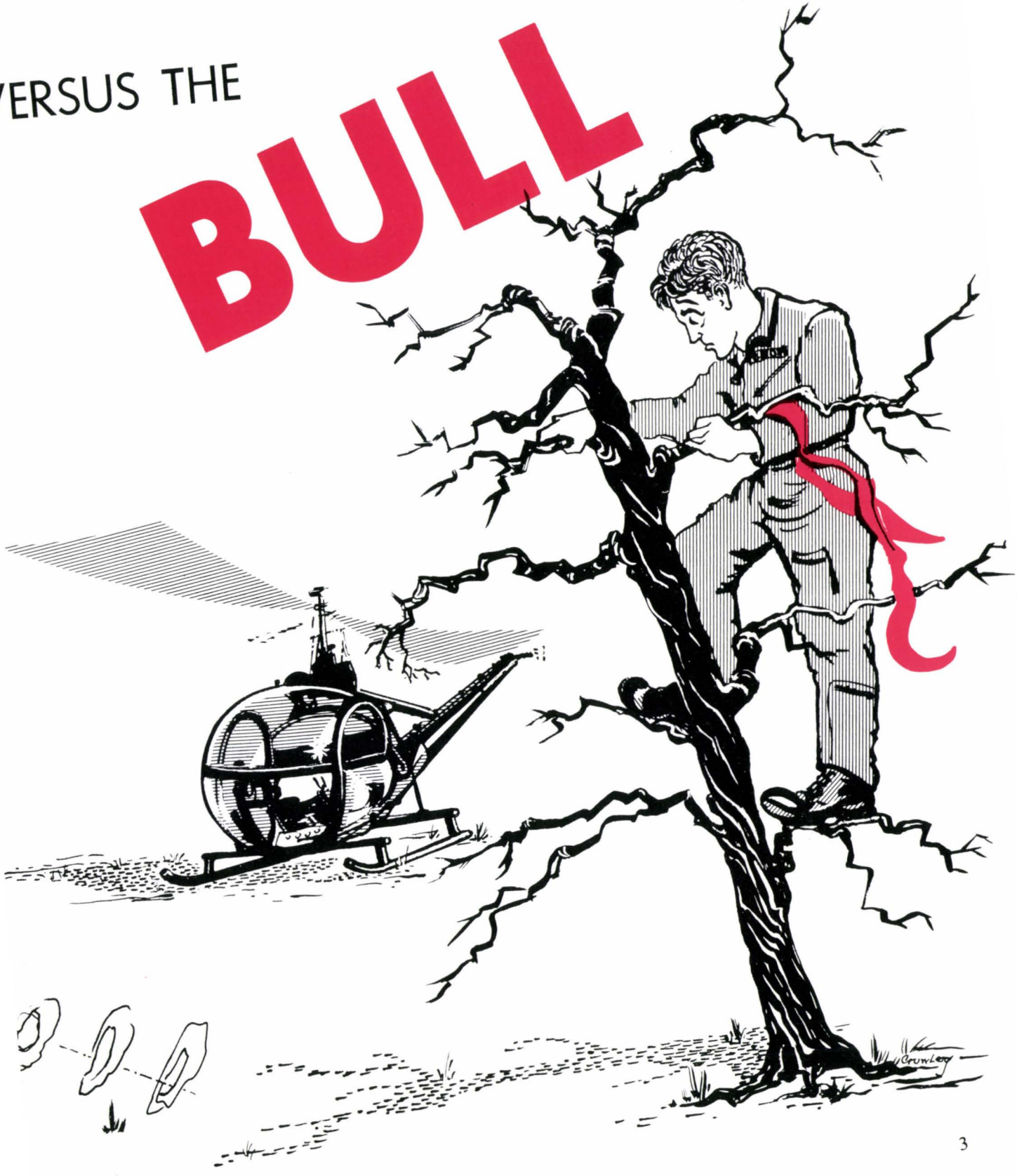
Having mastered the art of instrument flying a few years earlier, I had a considerable amount of actual weather flying, and the Jeppesen, International Civil Aviation Organization and Federal Aviation Administration procedures were all equally familiar. Carburetor ice, engine failure, lost radios and a blown tire had all come my way at one time or another. I felt that I had pretty well learned about flying—but then I met the helicopter, and that bull.

When I received orders to attend helicopter transition training I was pleased to expand my aviation horizons into the then rapidly growing Army mobility program. Qualification training was conducted at an Army installation called Camp (now Fort) Wolters in north central Texas where the winter winds can really blow.

It was my fortune to return from overseas in midwinter to attend the 8-week qualification enroute to my next assignment. While it is cold in north Texas when the temperature plummets below freezing and the northers begin to blow, the weather becomes doubly chilling when preflighting with a flashlight at 0630



VERSUS THE BULL



REMOVE BEFORE FLIGHT

while helicopters parked all around are churning up gale winds during starting, warmup and runup. Thus opens the curtain on the day of my life when I really learned what flying was all about.

After about a week of dual instruction I had managed to solo the OH-23D observation trainer without too much difficulty. In fact, I may have been a little too confident for a helicopter fledgling who had just learned that the helicopter, unlike the fixed wing aircraft, had two control sticks instead of just one. These had come to be called by the students simply the *go* stick and the *whoa* stick.

Each instructor in the school had three students and in order to maximize training was allotted two helicopters for each session. In this way he could have one student flying solo in one helicopter, one student undergoing dual instruction and the third student preparing for flight. After a period of 90 minutes the three students would change aircraft and position.

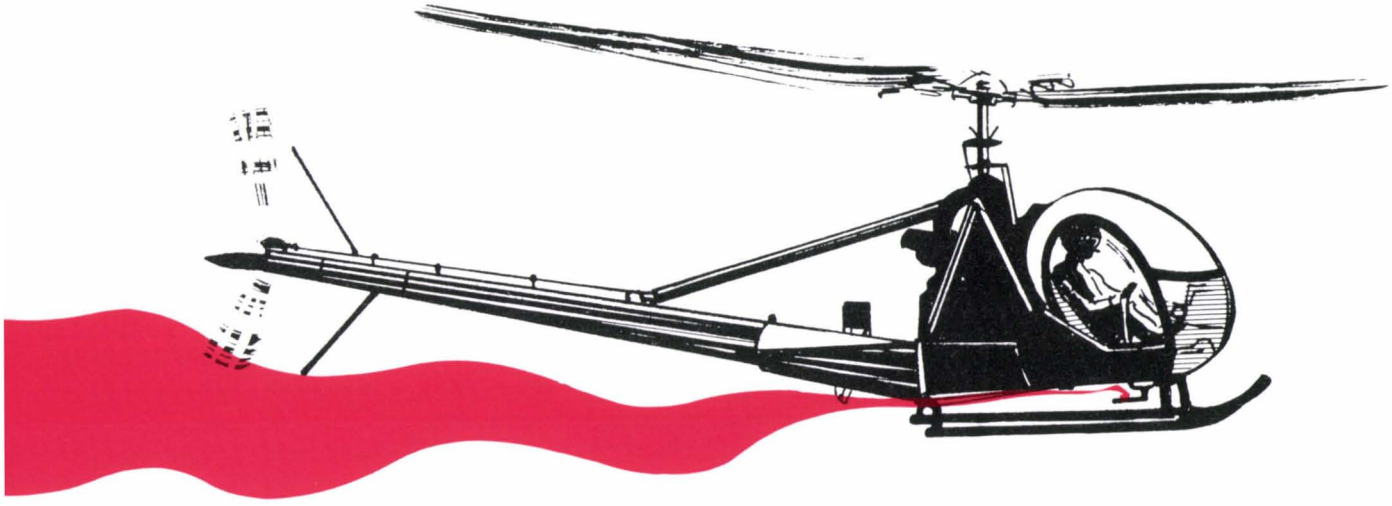
On perhaps the coldest day of the entire training period I was the solo student and hence had the responsibility of preflighting and preparing the solo ship for flight. The thoughts which raced through my mind as I walked across the broad parking apron in the predawn chill all focused on one thing: warmth. How could I get the ship warmed up and the heater going?

During fixed wing flight training I had learned the importance of a proper and thorough preflight inspection. Stories of bird nests, misplaced screws and even screwdrivers all had made indelible impressions. I was a "by-the-book" student, almost to the point of frustrating my instructor and fellow students. Unfortunately, in the intervening years I had been blessed with some very conscientious and most capable crew chiefs who preceded my daily inspections with equally meticulous inspections of their own. It was then almost inevitable that sooner or later my inspections might become less stringent and—occasionally—without benefit of an inspection checklist. Because of the large number of helicopters departing simultaneously during training, there are no crew chiefs with each aircraft and the pilot is on his own. Hence, the cold and complacency awaited only the third "C"—carelessness—to give me a headache I have never forgotten.

As I reached the ship I took the checklist from my pocket and began the inspection in earnest, moving rapidly from one item to the next. When I checked the motorcycle grip of the throttle control it would not turn. This was totally unsatisfactory, so I went to notify a nearby mechanic of my plight. When he forced the throttle one could see where moisture condensation had frozen in the cable linkage. With the problem diagnosed it was a simple matter to chip away a small ice deposit, warm up the linkage and the throttle then turned freely.

Although the immediate malfunction was solved, I was now about 10 minutes behind the other aircraft in the inspection, warmup and hoverout procedure. Not only was I getting colder due to the whirl of rotor blades all around me, but I was losing valuable training time. Still alert, however, to my inspection requirements I was somewhat overconfident with myself because I had just found one deficiency and corrected it. I hesitatingly tucked the checklist in my pocket and walked around the aircraft, completing a more cursory inspection than my conscience told me I should.

In a brief moment or two the "walk-around" was over and I



was comfortably in the helicopter with doors closed, rotor turning and at long last heat. Warm air flowed throughout the bubble and I settled back for a "by-the-book" runup, complete with the wrinkled checklist.

All was well, everything in the green and I called for hover clearance to the takeoff pad. The ship handled beautifully in the hover, no vibrations and good control response. Best of all the heater and defroster were doing a marvelous job in spite of the -10 degrees C. showing vividly on the free air temperature gauge. I was satisfied that in spite of my earlier tribulation I was well on my way to enjoying a pleasant training flight. Little did I know that only seconds away a chain reaction was about to begin which would leave my airman's pride bruised and battered with my face as crimson as the helicopter I was flying.

As the voice from the tower droned, "Number one pad, clear for takeoff," I pulled in collective pitch, rolled on throttle and began to accelerate onward and upward. A quick cross-check of the panel showed everything in order—all gauges in the green, engine and rotor tachometer needles joined, altimeter rising . . . but wait, the air speed is still zero. That's impossible because I'm flying through the air gaining altitude and air speed every second. A slight nudge on the instrument and still the needle is glued on zero knots. By process of elimination a more comprehensive examination of the situation includes glancing down through the bottom edge of the bubble. There blowing in the breeze was 12 inches of bright red cloth prominently stenciled in white: REMOVE BEFORE FLIGHT. The pitot cover, still tightly affixed to the pitot tube, had been forgotten in my haste. All manner of thought raced through my head as to how I could have overlooked such an obvious item. Jamming the checklist in my pocket before completing the preflight inspection was now a vivid memory. While I had been most concerned about the cold a few minutes before, I was now growing warmly uncomfortable as I began to ponder my situation.

As anyone knows who has flown an aircraft, fixed or rotary wing, with an inoperative air speed indicator, this really isn't too serious a problem—if the weather is good, if all other instruments are working properly and if you have a good idea as to what power settings and pitch attitudes will result in what air speeds.

Unfortunately, very little of my pitch and power fixed wing experience was applicable to the helicopter. If I had learned anything in my grand total of 15 hours of helicopter flying it was that you needed an air speed indicator on landing approaches. More importantly, if you were among the real unfortunate to experience an engine failure, an air speed indicator is essential to maintain an adequate lifting speed for autorotation.

Lastly, I guess I was more concerned about landing at the stagefield in the midst of some 44 fellow students, 15 instructors and an "all-seeing" flight commander operating the control tower. For, even if they were half-blind and looking the other way, they couldn't miss seeing the long red warning flag trailing violently in the 60-knot breeze beneath my helicopter. Without any reservation or trepidation I would automatically get a failing grade for the day, a *pink slip* as it was politely called. The embarrassment associated with such an amateurish blunder would probably surpass the academic impact however.

Continued on page 32

THE LONGEST MISSION

Captain Samuel C. Raines

U. S. ARMY AVIATION DIGEST

The flight over vast desert, shark-infested seas and rugged mountains had exciting and pleasurable moments, too. ". . . We were just about the right altitude to observe the bikinis and absence of bikinis." The mission was an invaluable lesson in precise flight planning

HAVE YOU EVER been on a long mission? I mean like 4,500 miles in 55 hours of daily flying? You are probably thinking, "Where in the world would you fly that long and what could possibly be that slow?" Well, aviation fans, would you believe ferrying the old U-1A Otter from Addis Ababa, Ethiopia, to Sandhoffen, Germany? Of course the trip entailed circumnavigating the Mideast hotspot. That is how I ended up on the wildest flight of my aviation career.

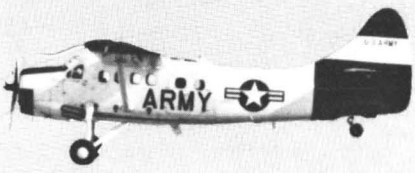
It all started about 3 days after I had reported to my new assignment in Addis Ababa with the Army Map Service. I was still in shock about actually being in the wilds of Africa. And with the altitude 7,500 feet above sea level I could hardly breathe. I was still wandering around thinking how soon the natives would probably attack when the colonel called me and said, "Sam, I have a mission for you. Ever flown an Otter?"

"No, sir." In fact I had only been in an Otter once in my whole life and that was in the Republic of Vietnam the year before.

The colonel just smiled and said, "Well, you're going to help fly one to Germany." He then proceeded to explain that I would receive a checkout and that someone was coming from Iran to actually pilot the Otter. I would be more of a copilot. Whew!

The operations officer presented me a file cabinet full of maps, charts and foreign clearance guides. Soon the "old-timers" (more experienced pilots of the company) began making cracks about the sharks in the Red Sea and how dry the desert in Saudi Arabia is. I became the most miserable, frustrated, confused fellow you could possibly imagine. However, the hardest part was yet to come. I had to tell my wife of only 30 days that I was leaving. . . . I was off on some wild transcontinental voyage. As you may suspect *that* went over real big.

I recall leaving the airfield



that evening looking at that huge, white beast (all our aircraft were white) and thinking that she sure was bigger than the little Bird Dog I flew in Vietnam.

In the morning I began to earnestly prepare for the trip. That meant planning the flight route and sending in as early as possible a request to overfly and land in nine foreign countries. I might add you can't even begin your flight until you receive written permission from each country concerned. The procedures for each are different and the foreign clearance guide must be followed precisely. In conjunction with this, you must calculate your entry and exit points as well as estimated times of arrival and departure and these must be accurate and precisely followed or you might wind up in a dogfight with a jet. In an Otter yet? . . . not much hope there!

After this came the stockpiling of emergency supplies. Such items as overwater survival jackets, C-rations and canned water are among the many required. You must have these provisions to assist your-

self in case you ditch or force land anywhere along the route. This particular trip would vary from mountains to deserts, from jungles to oceans. We had to be prepared. How about fuel? Remember, you can't always find 115/145 all over the world. Again, researching the FLIP guides is a must.

To make a long story short, the big day finally arrived. I might add the night before was spent dreaming of Red Sea sharks, wandering in the desert, harem girls in Turkey and landing on the French Riveria. What a night!

Bright and early the next morning there we were . . . well, not so bright. It was dark, very early and misty. We roared down the runway and broke ground at a speed of at least 60 miles per hour . . . thank goodness. Then the climb to clear 12,000-foot mountain peaks began. You know, we had so much emergency survival gear that I am surprised we ever got off.

We spent the entire day zigzagging around the weather and the mountains to reach Asmara (northern Ethiopia) on the Red Sea. After finally landing in Asmara, Jim and I crawled out of that bird two tired little boys.

Something we developed the first night, and followed throughout the remaining nine, was a good postflight discussion. We went over the day's mission and the following day's route, times, stops, checks and anything we could think of. Good planning always pays off.

The second morning we made an early takeoff over some very treacherous area . . . the shark-infested Red Sea. We had so much sea survival gear that I doubt seriously if we could have ever gotten out the door had the need arisen. The more we thought about those sharks, the higher we seemed to climb. I ended up with our rubber life raft practically in the seat with me. Who, me worried?

A good point to remember is that the aircraft manuals describe explicitly the proper ditching technique. It is wise to be familiar with those instructions—just in case. Fortunately, some hours later land appeared. Our scheduled stop in Jidda, Saudi Arabia, was approaching and desert surrounding it stretched endlessly to the east.

Landing in Jidda was a real ball. The armed guards were most anxious to see our passports. They couldn't understand how we were in the U. S. Army flying a red and white airplane with "Ethiopia—U. S. Map Mission" markings. After some hassling we finally convinced them we weren't really spies. Then during their search of our plane the guards found our canned survival water and mistook it to be beer. Since no alcoholic beverages are allowed in Saudi Arabia, the guards insisted we go to jail for smuggling liquor into their country. To appease these people I opened half my emergency supply and after much shouting, pushing and threats we were given permission to spend the night.

We spent an uneventful night combating the heat, noise and bugs in the local hotel. I did order a hot dog to curb a strong appetite, but what I got was cold, hard bread with a piece of dried goat meat. Adding a gallon of hot sauce and water, I man-

aged to swallow it.

The third day carried us practically across Saudi Arabia to Dhahran, with a fuel stop enroute at Riyadh. Looking all day at nothing but sand and desert makes a fellow very dry and thirsty. We came down from a cool 12,000 feet for our refueling stop. When I stepped out I really thought I was directly behind the exhaust of a helicopter turbine. What heat! Temperatures in Southeast Asia don't even approach that desert heat. The smart aviator will certainly take it easy and watch himself . . . heat does strange things to man.

The evening stop at the U. S. Air Force Base at Dhahran conveniently fell on Friday afternoon. Everyone knows that every Friday afternoon military posts feature a special event . . . happy hour. I literally ran from the plane to the local club just to find that the strongest drink available was iced tea with lots of lemon. Talk about a letdown . . . I could have cried. Once again country custom prohibits the consumption of alcoholic beverages. I downed my fair share of good iced tea.

The next day meant crossing the Persian Gulf and another border. These border crossings must be followed to precision with constant flight following and communication. Shiraz, Iran, was our first refueling stop with final destination for the day Teheran. There we stayed a couple of days while our sister element (Topographic Mapping Unit) performed maintenance on the aircraft.

Rest is essential on long flights. The aviator who brags how quick he ferried an aircraft someplace is very foolish and unprofessional. Though you should enjoy the experience of a long flight such as this one, professionalism should never be overlooked.

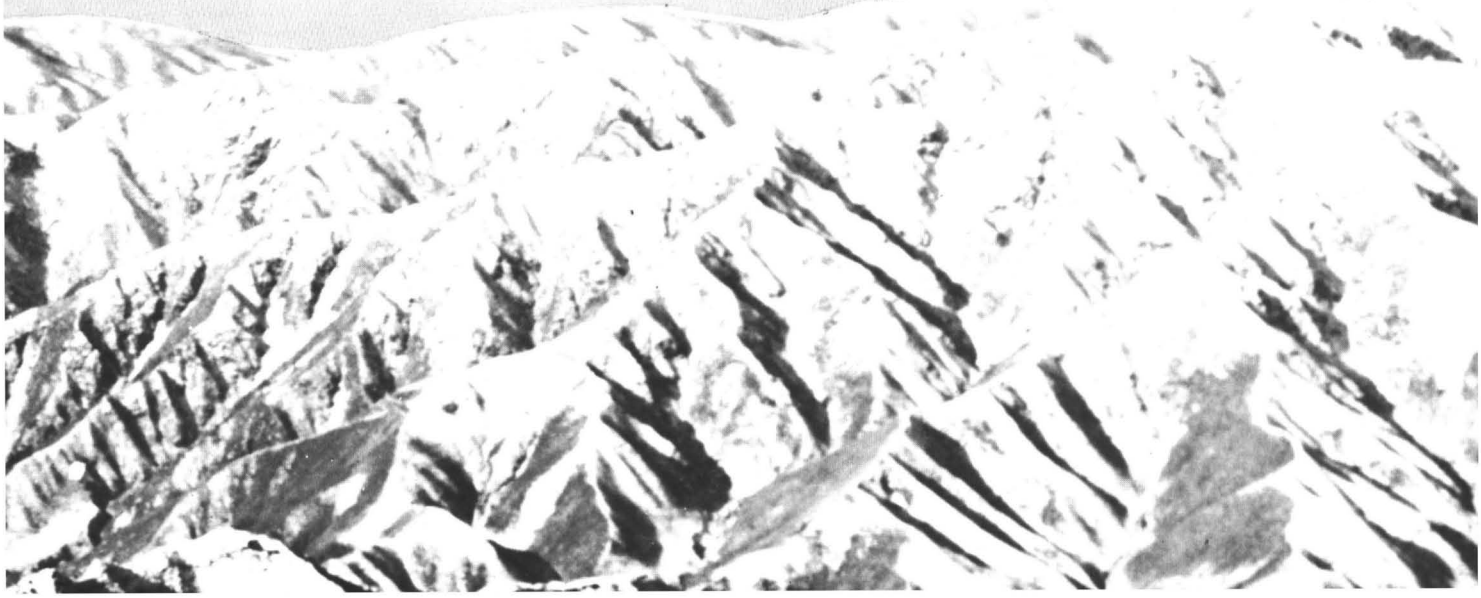
After our 1½-day layover we were again on our highly restricted flight into Turkey. The terrain changed quickly from water and endless desert to the most rugged mountain peaks I have ever seen. I doubt that a dime could possibly have rested flat on the terrain. Forced landing areas were impossible to find which does create some tension in a single-engined aircraft.

As a note to those who might face this same experience, this leg of our journey brought us within visual distance of Armenia and the Russian border. What the charts say about "improper radio signals" certainly holds true . . . we received two readings for nearly every beacon—one on our flight path and the other across the USSR border. We avoided that buffer zone like the plague. Had we been negligent I probably would be writing this article in Siberia.

It was here that a small crisis developed. We could not contact our flight following station for the Turkish border crossing. But true to rumors no sooner had we crossed over the line than we became the homing point for a very sleek, deadly looking jet. One thing for sure, the Turkish Air Force doesn't waste any time. It was quite clear that we were not to deviate one bit from the filed flight plan. Would you believe there wasn't a moment's hesitation in our action either. Soon there were two fighters circling ominously until we landed for refueling at Tabriz, Turkey.

Tabriz was our final destination for the day. That place is so remote I bet the camels use road maps. After many attempts we finally hitched a

Continued on page 24



Charlie and Danny's Write-In

Dear Danny: We have just completed making change 5 to TM 55-1510-204-10/5 and it appears the new single-engine procedure appearing in paragraph 4-23, page 4-2 certainly leaves much to be desired. Please note paragraph 3-54, item 3 on page 3-16 which calls for the autofeather switch to be off. Then when we lose an engine during takeoff (takeoff continued) the procedure as described in paragraph 4-23 doesn't include a prop feathering procedure, only a note and this isn't adequate as far as we are concerned. What procedure is being followed there at the school?

CPT R. C. M.

Danny's answer: The USAAVNS is aware of the discrepancy in change 5 and has already submitted the necessary forms to correct this mistake. Originally change 5 was submitted to prevent a fault in the autofeather system in the OV-1D from inadvertently autofeathering a prop. As soon as a fix has been developed, procedure in the dash 10 and checklist will be returned to normal.

★ ★ ★

Dear Danny: I have a question. The new TM 55-1520-210-10 (25 August 1971) states on page 3-8, paragraph 3-25, ENGINE SHUTDOWN, that after decreasing the rpm—

a. Check particle separator overboard vent for smooth air stream flow.

b. Check for evidence of fuel draining overboard from engine fuel drain line.

Please clarify just what is the particle separator overboard vent and how to go about checking it while the aircraft is running. Also, shouldn't (b) the check for fuel draining overboard be made immediately after the throttle is rolled full off?

Also, shouldn't item 12, Radios and ICS—OFF, be accomplished before engine shutdown to prevent drain on battery and possible damage to the radios? These procedures in the dash 10 have us all baffled.

CPT T. L. T.

Danny's answer: The particle separator overboard vent is a tube connected to the lower portion of the particle separator and extends downward through the lower portion of the aircraft. The location of this vent is just aft of the hellhole and is approximately 1 inch in diameter and extends below about 1½ inches. The check for a smooth air stream flow must be accomplished while the engine is running since the flow of air comes from the bleed air. As stated in TM 55-1520-210-10 (25 August 1971), page 2-8, paragraph 2-6, d. UH-1H helicopter serial no. 68-16066 and subsequent are equipped with self-purging sand and dust separator which utilizes a constant supply of bleed air from the engine to accomplish the separation and self-purging functions. A modification work order is in effect which will modify all UH-1D and H helicopters manufactured prior to no. 68-16066. The check for fuel draining overboard is made before retarding throttle. This accomplishes a check on an oversupply of fuel to the engine while in operation. The reason for not turning radios and ICS OFF before shutdown is to let the pilot have communication in case of emergency during shutdown. The drain on the battery is very low for receivers only. No damage should be done to the radios due to the built-in protective systems. Thank you for your letter and your interest in the dash 10 publication.

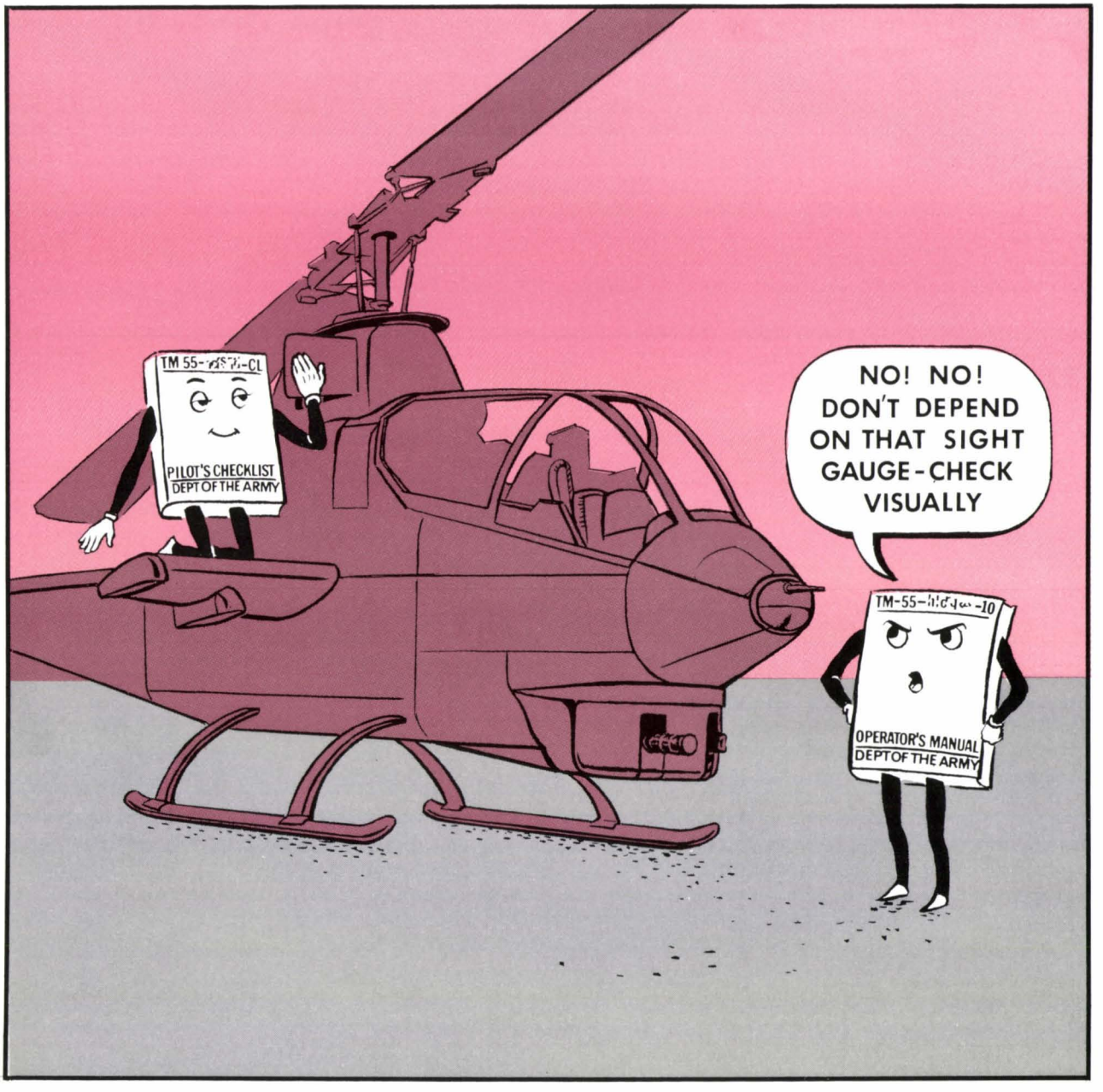
★ ★ ★

Dear Charlie: While following the checklist on the "Snake," area 1, item 16 reads "Pylon access antenna(s) engine oil reservoir—check."

Now, I have found that the sight gauge isn't always correct; it can vary. How do you suggest checking the oil level?

CPT T. L. D.

Charlie's answer: Referring to TM 55-1520-221-10, paragraph 3-9, item *16 Pylon access—FM, UHF, VHF, antenna(s)—condition; engine oil reservoir—condition and security; remove cap and



check oil level, then secure cap.

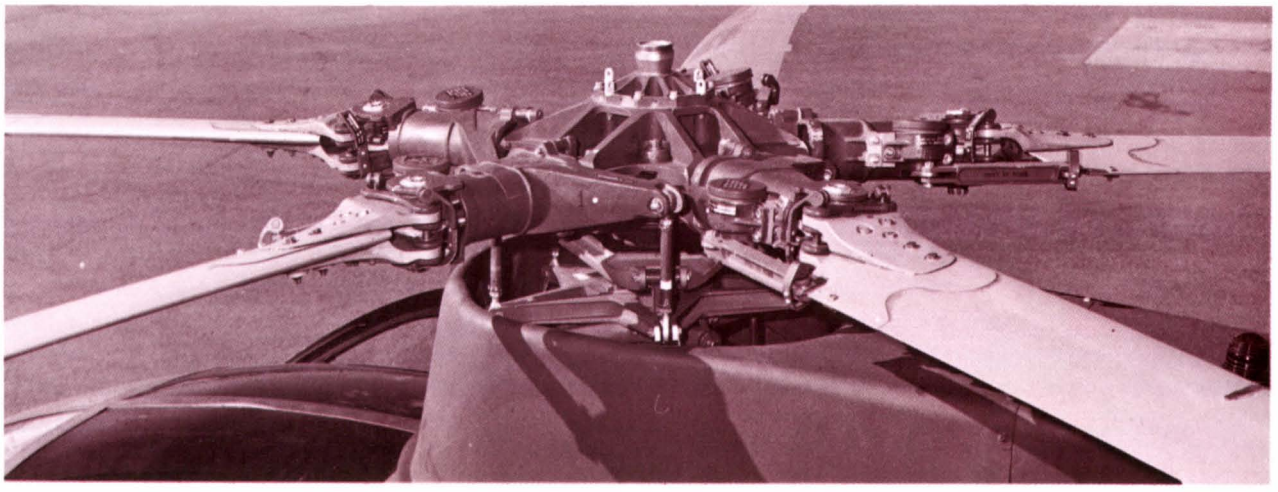
You are absolutely correct when you say that the sight gauge isn't always correct.

The recommendation has been made to add a NOTE following item 16 (remember NOTES follow items to which they pertain and *cautions* and *warnings* precede) which should read:

NOTE
DO NOT DEPEND ON SIGHT GAUGE WHEN CHECKING ON OIL LEVEL. REMOVE OIL CAP AND CHECK VISUALLY.

Since the dash CL is an abbreviated form of chapters 3 and 4 of the dash 10 we can see that it is impossible to include detailed instructions, so it pays to read and study the dash 10.

Thanks for the observation and keep looking closely.



THE QUIET ONE

Helicopter noise is a problem not only to the military strategists but also to the civilian population. The Advanced Research Projects Agency now introduces a "quiet" OH-6

IF A COMMANDER can surprise his adversary with a sudden move or attack he usually can defeat him. The helicopter's mobility often affords a commander this element of surprise. But helicopters also have disadvantages. One is noise. Many surprise attacks have failed because the enemy was able to hear the helicopters approaching.

Advanced Research Projects Agency funded an effort in 1969 to investigate what could be done to reduce the external noise of helicopters. Three contractual efforts were funded, one of which was with the Hughes Tool Company using the OH-6A. The Eustis Directorate, Army Air Mobility R&D Laboratory managed the research effort. The OH-6A was modified in an attempt to significantly reduce its noise level.

Helicopters like most large pieces of rotating machinery make noise. In addition the whirling blades of the helicopter disturb the air and send forth noise waves which are detectable miles away.

The most effective way to reduce noise is to slow down the machinery. But when machinery in a helicopter is slowed the rotor blades are also slowed, thus reducing lift. To offset this the OH-6A has had one blade added to the main rotor and two blades added to the tail rotor. This enables the pilot to reduce engine and rotor speeds to as little as 67 percent of normal inflight levels and still maintain necessary lift and thrust.

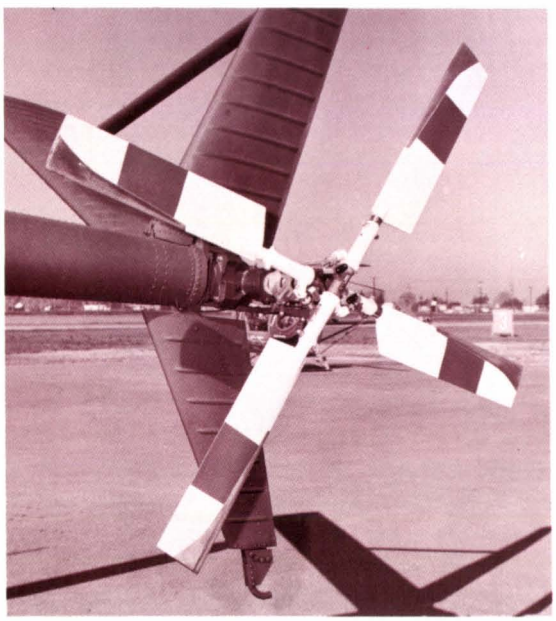
Performance, including maximum speed payload, seems to be virtually unaffected by the modifications. Hughes Tool Company states that the new rotor system is capable of increasing the OH-6A's payload by 600 pounds and its air speed by 20 knots.

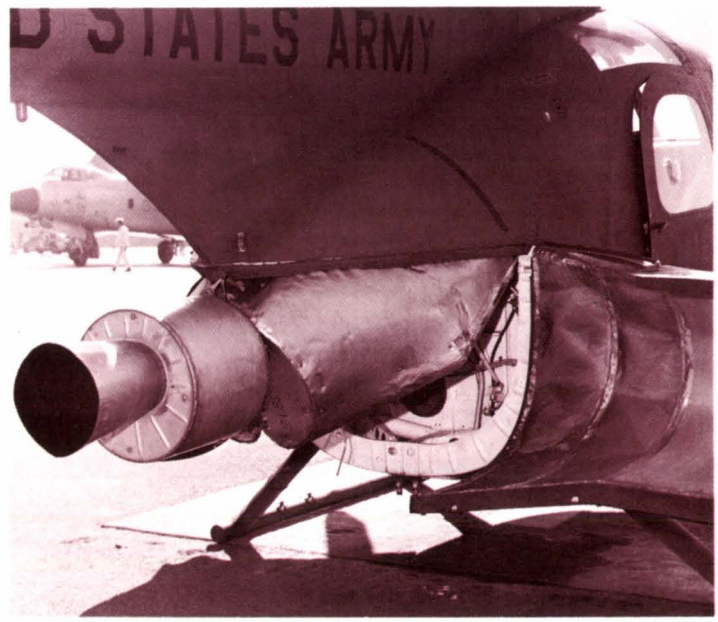
In addition to the rotor modifications a muffler has been designed to stifle the roar of the engine exhaust and the whole power plant has been wrapped in a "cocoon" of sound blanketing material to absorb stray engine noises. The engine air intake has been treated with soundproofing materials and the airflow redirected to prevent transmission of the engine's characteristic compressor whine.

The tips of the main rotor blades have been reshaped to reduce the severity of the tip vortex phenomenon, a kind of whirlwind generated by the blades which is a major contributor of helicopter noise output.

As more and more helicopters are used by the civilian population noise created by these aircraft will become more of a problem. A helicopter so quiet that it can go virtually undetected on the battlefield will not only benefit the Army, but also contribute enormously to the technology of noise suppression in our cities.

The "quiet one" is an OH-6A with modified rotors and engine exhaust muffler. The 5-bladed rotor system has a design gross weight of 3,150 pounds, speed 150 knots. The control system does not use hydraulic or electrical boosts. An engine air inlet fairing surrounds the rotor swashplate. The 4-bladed tail rotor has cambered airfoil. Longer blades increase thrust at reduced rpm. At 100 percent N_2 rotor turns at 1900 rpm and in quiet mode at less than 1300 rpm. Prototype blades are phased at 75 degrees/105 degrees





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

Major Nicholas E. Barreca, M. D.

Aeromedic

THE ARTICLE at right emphasizes the importance of a sound and operational hearing conservation program. Commanders have recently been reminded of this responsibility in DA Circular 40-79 entitled *Command Emphasis on Hearing Conservation Programs*, dated 21 June 1971. It was also the subject of the DIGEST "Aeromedic," March 1970.

A number of areas need additional emphasis, however. Often there is a tendency in aviation to concentrate only on air crewmen. Not infrequently ground crewmen or support personnel are overlooked. Their exposure can be more intense if not as enduring. They too must be protected. Earmuffs are available through normal supply channels to provide this protection (see TB Med 251). Another frequently forgotten group is aircraft passengers. Whether they be infantrymen on a lift in combat or civilians aeromedically evacuated stateside, specific protection is available. For the former situation impregnated cotton earplugs, FSN 6515-721-9092, may be requisitioned. In the latter, again the earmuffs would be appropriate. Aviation personnel should always be prepared to cope with noise whether or not flight is anticipated. Often *incidental* exposure cannot be avoided. The only convenient way to achieve this protection is to carry it continuously in the form of earplugs. They are small, lightweight and durable. They wash with soap and water and can be reused indefinitely. Supplies may be obtained through medical supply channels, usually distributed at medical dispensaries.

So much for protection per se. How about finding out whether protection is in fact being used or effective. Some individuals are more susceptible than others and the only way of finding out is by performing annual and *accurate* audiograms. Often air crewmen shy away from audiograms. They see them as a threat to their flying status. As a result they not infrequently deny hearing loss by inaccurately responding to audiometric signals. This does them more harm than good. Early noise induced hearing loss is not recognized by the individual. Since it does not involve essential speech communication frequencies, it does not interfere with performance. Thus, it is not medically disqualifying. The flight surgeon must know about it to ensure adequate future protection and avoid continued and more likely disqualifying hearing loss. All air crewmen should provide as accurate an audiogram as possible to avoid continued and more significant hearing loss.

The last area of concern in noise abatement is that of the noise we sometimes unintentionally generate ourselves through poor design of equipment. Avionics equipment is far from our goal of providing minimum noise with maximum speech intelligibility. While we go to great lengths to protect against outside noise by the use of a helmet, we often let it right back in through a "hot mike" due to poor microphone design. The U. S. Army Aeromedical Research Laboratory (USAARL) is currently experimenting with a variety of designs including newer ceramic and condenser microphones. These are more directional and thus noise canceling in their effectiveness. There is also excellent transmission of speech ensuring intelligibility. A great deal of work still remains in the design of avionics systems to reduce inherent systems noise (i.e., static, squawk, chatter, fuzz, snow and other forms of distortion). Listen to a few ATC tapes if you disbelieve. Better yet, make a survey on operational flights to see how often that fond phrase is used, "SAY AGAIN!"

"Silence Is Beautiful"

Say Again All After "ATC Clears"

"What'sa matter, fella, can't you hear?"

Captain Thomas L. Doane

AN UNACCEPTABLE percentage of aviators are demonstrating an undesirable downward trend in hearing acuity during annual physical examinations. This trend predominately results from three causes: (1) intensities of noise generated in Army aircraft exceeds criteria established as maximum acceptable, (2) prolonged exposure to noise beyond safe damage-risk criteria while wearing protective hearing devices improperly, and (3) insufficient education of the aviator on the basic fundamentals, effects and representative levels of noise to which he is exposed. The primary objective presented here is to provide the Army aviator with a comprehensive and illustrated analysis of noise as it relates to Army aircraft. Applying this information an aviator can determine why he should make a concerted effort to protect his hearing.

There has been considerable research efforts by the armed forces and private organizations directed toward development of protective hearing devices. The U. S. Army Aeromedical Research Laboratory (USAARL) at Ft. Rucker, AL, is one prime contributor to this effort. Based on their own studies of the basic characteristics and representative levels of noise inherent in Army aircraft, USAARL has tested and evaluated an extensive quantity and variety of protective hearing devices on the market. The variety of the devices evaluated included earplugs, earmuffs and flight helmets. The primary purpose for this testing was to discover the best sound attenuators for use by aviation personnel.

Currently in use by aviators are three protective hearing devices found to be acceptable attenuators of noise: the Army Standard earplug (V-51R), the combination of the V-51R and the APH-5 flight helmet, and the SPH-4 flight helmet. However, for any beneficial results to be realized in the use of these protectors, several factors relative to their use must be considered. Earplugs must be of the proper size for the individual ear and must be properly inserted to ensure perfect sealing of the exterior ear canal. The APH-5, incorporating foam rubber supraaural (resting on the ear) ear cushions, has poor attenuation capability because of inadequate compliance of individual ear and head shapes to the cushion and must be supplemented with earplugs to achieve maximum results. The SPH-4 assuring a more reliable seal through the use of circumaural (enclosing the ear) rigid earcups, provides the best sound attenuation achieved by a flight helmet alone, but again improper fit or wear will negate this advantage.

Table I depicts mean levels of attenuation that can be achieved through proper fit and wear of protective hearing devices. Mean attenuation values are shown in decibels (db).*

A summary statement appearing in the "Army Flight Surgeon's Manual" states:

> The amount of protection afforded by the perfect

TABLE I

SOUND ATTENUATION CHARACTERISTICS OF ARMY PROTECTIVE HEARING DEVICES

MEAN ATTENUATION (db)

Frequency (cps)	Earplug, V-51R	Headset alone	APH-5 Helmet	APH-5 & Earplugs	SPH-4 Helmet
125	18	5	10	20	16
250	18	5	5	18	15
500	25	7	6	25	25
1,000	25	13	15	33	25
2,000	30	20	30	40	35
4,000	35	30	40	45	45
8,000	35	30	35	40	36

*Decibel is a term describing a measurement of force/area. The human ear, in its most sensitive range, responds to a sound pressure as small as 1 db or 0.0002 dyne per square centimeter

sealing of the external ear canal approximates 35 db. The wearing of a helmet of good acoustic design can increase this protection only 8 db due to reception of sound on facial bones, ribcage, sternum and their subsequent transmission to the ear.

By this statement it is apparent that protective hearing devices are approaching the state-of-the-art in protection for the higher frequency spectrum. However, the leaking of sound past these hearing protectors as a result of either improper fit or wear will largely reduce any protection available. To be alerted to the effects of wasted protection a person must have a comprehensive understanding of his noise environment.

Noise is unwanted or unpleasant sound which usually lacks musical quality and is of an annoying nature. As it relates to aircraft, noise is produced abundantly by mechanical components and systems. Collectively these noise generators contribute to the overall noise environment of an aircraft. Basically three fundamental characteristics of all sounds relate directly to the type of noise generated. These are the sound frequency generated, the manner it is generated and the intensity it is generated.

Sound frequency is simply a number of sound waves per second (cycles per second) produced by a generating body.** The human ear acts as an acute receiver of slight pressure changes and is capable of measuring these pressure changes from a low of 20 cycles per second to a high of 20,000 cps. For effective perception of speech signals the ear must receive and be able to interpret frequencies at a minimum between 300 cps and 3,000 cps. The frequencies associated with noise may vary from a pure tone (a musical note) to a narrow-band of frequencies, to a wide-band of frequencies. The frequency of sound determines a device's attenuation.

The manner in which a noise is generated may vary from a constant state, similar to the whine of a turbine engine or transmission, to an impulse (on and off) state characteristic of armament system operation or rotor blade slapping.

Most important in terms of its ultimate effect on aviator hearing ability is the intensity of the noise generated. Table II illustrates general sound pressure levels, measured in decibels in which the ear responds to human speech.

What are the effects of noise exposure on an aviator? Concentrated research efforts conducted

TABLE II

AVERAGE SOUND PRESSURE LEVELS FOR TYPICAL EAR RESPONSES TO SPEECH

Intensity in decibels (db)	
- 150-160	Damage possible exclusive of duration
- 140	Threshold of pain
- 130	Feeling tickle
- 120	Average threshold of discomfort (pure tone)
- 110	Loud shout at 1-foot distance
- 100	Discomfort begins for pure tones and speech
- 90	
- 80	Loud speech
- 70	
- 60	Average conversation
- 50	
- 40	Faint speech
- 30	Whisper (average)
- 20	Quiet whisper
- 10	
- 0	Threshold of hearing

TABLE III

GENERAL RELATIONSHIPS OF FREQUENCY, INTENSITY AND DURATION OF EXPOSURE

Type of Noise				Duration of
Narrow-band or impact		Wide-band		Exposure (mins)
85 db	or	95 db	for	480 (minutes)
95 db	or	105 db	for	48
95 db	or	115 db	for	4.8
105 db	or	125 db	for	.48
115 db	or	135 db	for	.048
125 db	or	145 db	for	.0048

**Sound waves are propagated through any conductive medium, the most common being the atmosphere. A wave is composed of a compression and expansion cycle of the molecules of the air. Sound pressure changes are related directly to this cycle and are interpreted by the ear as frequency

in the past two decades reveal no specifics on temporary or permanent impairment. However, the consensus of opinions stress the following: (1) because of tremendous variations between individuals it is impossible to specify the exact maximum sound level and duration of exposure the ear will tolerate. In some cases levels high enough to hurt some ears have no lasting effect on others, while in retrospect levels well below those that feel unpleasant can injure some ears; (2) in general the longer the ear is exposed to high intense noise, the greater the potential for damage; (3) pure tones are more damaging than wide-band noises of similar intensities; (4) frequencies above 300 cps appear to have more effect on impairment than do lower frequencies; and (5) hearing losses usually begin in the frequencies above that needed to hear speech, but continuous exposure without protection will ultimately affect the speech-hearing range.

To combat the effects of noise on aviators, the armed forces have approached the noise problem by providing guidance on safe limits the average ear can tolerate and by establishing maximum acceptable noise level criteria for aircraft.

Table III illustrates an estimated damage-risk criteria believed to represent a safe 8-hour daily exposure for the average ear. It is only representative of an average statistical evaluation of a large population group and does not reflect individual reactions to noise exposure.

Military specification, MIL-A-8806A, entitled "Acoustical Noise Levels in Aircraft" was developed to specify general requirements for the control of acoustical noise in occupied spaces of aircraft. It delegates responsibility to the manufacturers to design their aircraft below maximum acceptable noise levels. This specification recognizes that the maximum noise levels established, ". . . represent a compromise between those desired and those considered attainable within the state-of-the-art of noise control in aircraft."

Table IV depicts a noise measurement comparison of four current inventory aircraft (UH-1, CH-47A, U-8D and OV-1) versus maximum criteria in MIL-A-8806A during normal cruise flight. Noise levels were measured in the cockpit areas of the respective aircraft as follows: the UH-1 was measured at the centerline of the fuselage between the pilots; the CH-47 measurement was taken directly behind the pilots at station 95; the U-8D was measured at the right ear of the right pilot; and the OV-1 was measured at the centerline of the cockpit. Representative figures are shown in decibels. The overall level (OAL) represents a culmination of all intensities in all octave bands and is arrived at mathematically.

The data in Table IV represents one condition of aircraft operation. Increasing the aircraft load or performing maximum performance maneuvers will result in a simultaneous increase in the levels of noise emitted. The data also represents only four aircraft in common use, but representative figures for other types and models are comparatively similar in exceeding the criteria in MIL-A-8806A.

Why should an aviator make a concerted effort to protect his hearing? This is evident by the data in Table IV which indicates, for the most part, that actual noise levels are higher than the safe damage-risk criteria and noise control specifications for aircraft. An aviator is expected to operate efficiently within this environment for prolonged periods of time and therefore must be protected from temporary or permanent impairment of his hearing.

Current protective hearing devices will bridge the necessary gaps to provide adequate protection. The ability of these devices to protect depends on the capability of the device to attenuate sound's varying frequencies and sealing the inner ear off from the noisy environment. The SPH-4 or the combination of the APH-5 and earplugs are the best attenuators of noise available.

Flight surgeons can provide the expertise on fitting hearing devices to the individual. An aviator should have his helmet fitted during his annual physical examination or at more frequent intervals if he feels he is not achieving maximum benefit.

TABLE IV

NOISE MEASUREMENT COMPARISON OF UH-1, CH-47A, U-8D AND OV-1 WITH CRITERIA IN MIL-A-8806A

		Frequency by Octave-Bands							
	OAL	37.5 75	75 150	150 300	300 600	600 1200	1200 2400	2400 4800	4800 9600
UH-1	109	100	101	102	96	88	84	82	78
CH-47A	113	100	101	100	102	103	104	111	102
U-8D	108	100	107	102	98	87	84	83	75
OV-1	113	103	111	107	94	88	92	94	87
MIL-A-8806A	106	104	104	104	96	90	86	75	75

Mark! Mark!

Although this target-marking technique has disadvantages and has not been extensively tested for accuracy, the author presents a thought-provoking concept which may be beneficial to those in the field

Major Charles D. James

EVER TRY IDENTIFYING a specific piece of terrain without signals? Developing adequate signaling techniques has always been a major challenge in the field, and for Army aviation this problem is no less complex.

Aerial observation has certainly simplified terrain association, with many possible reference points coming within the visual field. In some cases the problem may be further simplified for aviators when either smoke is used or fire is directed into an area. But while tracers and rockets can be placed accurately from various altitudes, smoke drops are thought to be accurate only from low altitudes. However, since low altitude drops are highly vulnerable to enemy ground fire, this article concerns itself with a new, high altitude smoke drop technique.

A classic example of the necessary use of smoke occurred in the mountainous I Military Region in the Republic of Vietnam. A flight was inbound, low level, across Elephant Valley. The landing zone (LZ), lying between a series of low hills, was hidden from view. No reconnaissance had been made but the command and control (C&C) aircraft was nearby directing artillery and aerial rocket artillery. The flight was about a minute out when artillery ceased and the gun run began. The wind in the area quickly dissipated the smoke which was intended to help direct the lead aircraft.

Popping up from behind the hills on a long final, lead declared he couldn't discern the touchdown point. The C&C was paralleling the approach at 2,000 feet over the LZ. Quickly the air mission commander (AMC) made a turn over the position dropping smoke at each end. Unknown to the AMC the first smoke landed at the approach end while the second landed far short. Now the flight was disappearing below the C&C.

The command and control aircraft executed a turn to realign itself so the ground commander could observe the landing. The lead aircraft dutifully touched down between the two smokes on a 10-degree slope with stumps and 30-foot takeoff barriers—the "best" area between the markers.

Fortunately the flexibility of the mission allowed the employment of ground forces at this location and all aircraft completed the mission without mishap. However, it was evident a more accurate delivery means or technique had to be developed. Since it is easier to test a technique than develop an expensive new delivery means, the new technique was tested first. In the final analysis it negated the means design requirement, proving no special equipment would be required.

The first step was to identify the target line. Placing the aircraft in straight and level flight, points were overflown bringing the "picture" from beneath the pilot's instrument panel directly between the pedals. It was discovered that at any altitude below 2,000 feet above ground level (AGL) winds did not significantly alter the line determination. For all practical purposes the target was brought equidistant between the pedals. This

produced the best alignment. Banking had an uncontrollable effect so alignment had to be established at least by the time you had a steep sight picture position.

In selecting the release point the seat was adjusted to the full up, full forward position. Altitudes varied from 500 to 2,000 feet, air speed from 60 to 100 knots. As altitude decreased below 500 feet the angle became shallower, just as higher air speeds below 1,000 feet required a shallower angle. The object became one of selecting a speed range which could be applied to the indefininte AGL height and obtain 50-meter circular error probable (CEP), first drop accuracy. The final release point selected was the floor edge located between the pedals. This is where the picture disappears. Thus, a fairly consistent angle was obtained using the previously established seat position.

Normally 1,500 feet at 80 knots with a proper line of flight and seat position (smoke was released the instant the target disappeared) provided the CEP accuracy needed to identify the single ship LZs which are cut into the ridges of the mountains. Often the command "Drop right! Drop left!" was used while employing two different smoke colors. The ideal solution was for a direct hit with one color, but either a bracket or single hit within the CEP would be acceptable.

Individual CEP errors can result from differences in torso lengths as well as leaning fully back in the seat. If the crew slings the smoke instead of dropping it from the extended arm position, line errors will also result. However, these errors are rather insignificant unless the target is a specific foxhole.

Using the above procedures should enable you to achieve a high altitude, first drop mark without practice and without needlessly endangering the aircraft on low level overflights. Look at the advantages:

- The beginning and ending of an LZ can be designated.
- Wind indicators can be placed on hilltops to give data to an approaching flight.
- Medevac crash locations can be marked without endangering the crew.
- Diversionary LZs can be easily marked by the C&C aircraft.
- Threat areas for gun runs can be designated.

The repeated use of this technique to refine individual positioning usually resulted in consistent accuracy down to a 10-meter CEP. That's a "Mark! Mark!" if there ever was one!

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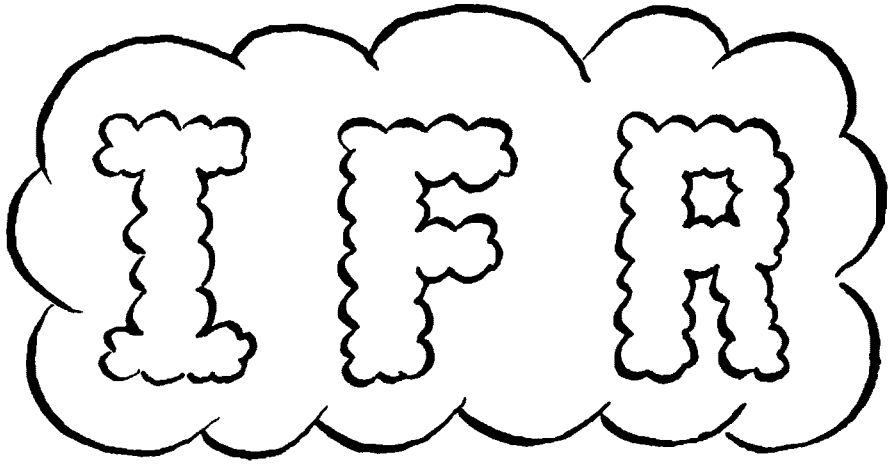


CW2 Thomas A. DeSimone

Relaxing after release from a tactical mission, while en-route home . . . the irritation of unscheduled prolonged flight . . . the ingredients for a catastrophe

THIS STORY IS NOT about an accident. It is, however, about a personal experience of mine which should have resulted in a catastrophic accident. The mistakes leading to this incident were all mine, and though I am ashamed of them I do not mind writing about it if someone else may benefit.

I was stationed in IV Military Region on my tour in the Republic of Vietnam. My company had been working night hunter-killer along the border for 2 months. I enjoyed flying at night, but I did not care for hunter-killer very much. This was because we flew most of the night and tried to sleep during the day. Any pilot who has gone through this little drill knows what I'm talking about. By the end of the night you find it hard to keep your eyes open, even while you're flying.

On the evening of 2 December 1969 at 1800 hours seven UH-1 Hueys from our company departed Vinh Long for a town called Moc Hoa. Moc Hoa

is about 1 mile south of the Cambodian border. In our flight was a C&C, a lightship, two guns and three liftships. I was flying trail aircraft in the lift section.

The night was fairly routine. We made two insertions and did a few odd jobs. We were released at 0430 hours, all tired and everyone wanting to get home and get some sleep.

We departed in a flight of five and headed due south toward Vinh Long. Our guns flew to our right rear. The weather had been fine all night. There was no ceiling and the visibility was unlimited.

I was enjoying the flight home when our number two aircraft announced his tail rotor chip detector light had come on. He elected to go back to Moc Hoa, check it out and wait for our maintenance aircraft if necessary. I was told to escort him back and wait until he could find the trouble and resolve it one way or another.

We both shut down at Moc Hoa. Our crew chiefs cleaned both plugs. The aircraft was run up but the chip detector light stayed on. We decided to call maintenance and have them come out and look at it.

There was nothing more my crew chief and I could do to help, so we took off for Vinh Long. Since the pilot had less than a month incountry I let him fly us back for practice. The night was still clear. I called Delta Center for flight following and then called my tactical operations center to have them get maintenance up to help the downed aircraft. I could see miles in every direction—Dong Tam to the east, Sadec to the west and Can Tho-Ben Thuy to the south. I could not see Vinh Long, however, and this puzzled me.

As we got closer to Vinh Long I discovered the reason. The airfield is located on the southern bank of the Mekong River. Here the river divides into three separate branches. It is very damp in the early morning. Ground fog completely enveloped the field and the town. It stretched upward to an altitude of 800 feet. It seemed solid and glowed faintly from the lights underneath. I cursed my luck. I wanted to get to sleep so badly. Maybe I can get in there somehow, I thought; the rest of the flight did. If not I could always go down to Can Tho and wait it out. I QSYed from Delta Center and came up Vinh Long Tower. I also took control of the aircraft.

"Vinh Long Tower, Knight 771."

"771, tower, good morning."

"Good morning, Vinh Long, 771 is 6 miles to the north for landing. What's your weather?"

"Not so go, 771. We are 300 feet and 3 miles and it looks like it's closing down."

"Understand tower. Do you think I could make it in there?"

"Ah, 771, we just had a bird come up from Can Tho. He made it by following the highway and landing to the west. He said it was about 300 all the way, but I don't know about now. He landed 20 minutes ago."

"Thank you, Vinh Long."

I decided to try. I knew I shouldn't but all I wanted to do was land and go to bed. It had been a long night.

"Vinh Long, 771, I'll give it a try."

"Roger, 771, call when you have the airfield in sight. No reported traffic."

The highway, route 4, ran north and south between Vinh Long and Can Tho. It entered the town of Vinh Long about ½ mile east of the runway. I would have to go south beyond the fog bank, find the road and follow it north low level. This would put me on an extended left base to the airfield.

I followed the fog bank around to the west and south. I found the highway and began my descent. I told my pilot to turn off the anticollision light and navigation lights. We got under the fog at 300 feet. I could see the lights of the airfield in front of me. We were about 5 miles to the south. It was hazy but I thought I could make it.

I was trying to stay below the ceiling but I was being forced lower and lower. I was below 200 feet and I could see the outline of the hootches below me. I was getting nervous. The airfield was getting harder to see and the ceiling was getting lower. Suddenly we were IFR.

"Shucks," I thought, "now we've got problems. Better get out of here." I slowed to 60 knots and adjusted my power to 500 feet-per-minute rate of climb. I started making a standard rate right hand turn.

"Vinh Long Tower, 771, I'm IFR at this time making a climbing right hand turn and I'll be going to Can Tho to wait this fog out."

"Roger, 771, call when VFR."

About this time I noticed a flashing red blur all around the cockpit. We were in the turn about 500 feet and 60 knots but I was beginning to feel disoriented. My pilot had not turned off the Grimes light. As I told him again to turn the light off my feeling of disorientation felt worse. Suddenly the nose pitched over and down. I believe I just stared at the instruments, not reacting at all. When I did come to my senses the air speed indicator was going through 100 knots. We were at 200 feet and the vertical speed indicator was passing through 1,000 feet-per-minute rate of descent. I was applying aft cyclic when we broke out of

. . . I just stared at the instruments, not reacting at all . . .

the fog. I saw palm trees whizzing by my windows. Luckily there were open rice paddies to our front. The tops of the trees were above us now and we almost hit a hootch. We started to climb again. We were safe.

"Knight 771, Vinh Long Tower . . . Knight 771, Vinh Long Tower."

"Tower, 771, we are VFR at this time proceeding to Can Tho, request QSY Delta Center."

"Roger, 771 frequency change is approved, see you later."

I gave the controls of the aircraft to the pilot. We flew to Can Tho, landed and shut down. It was 0600 hours. At 0800 we flew back to Vinh Long which was clear. I finally got to bed.

The mistakes I made on this flight were obvious. I put comfort ahead of safety and overconfidence ahead of caution. All pilots make mistakes. Human beings are not infallible. The good pilots look at these mistakes, try to analyze why they were made and proceed accordingly.

I have never again risked my aircraft and crew for such flimsy reasons. I always make sure the pilot is briefed on procedures for inadvertent IFR. I always make sure the destination of the aircraft is clear long before I get there. In other words, I take small, extra precautions to ensure I will never be placed in that type of position again.

The Longest Mission

Continued from page 9

ride into town from the airfield. Once again we spent the night in a real swinging hotel which we thought was "a nice place." It turned out to be a real experience. Just outside our room was a courtyard where people were singing, dancing and drinking. All kinds of evil-looking men were hanging around and I figured at any moment one would pull out a long, curved sword and do a dirty job on some innocent bystander . . . like me. The grand finale occurred later that evening when for some reason the local police raided the hotel. The purpose was mainly to check out "us foreigners" and our passports. Morning came none too soon; we were delighted to leave.

Back on the plane with our usual delightful breakfast of cold C-rations the day crept by. Our refueling stop was Diyarbakir, where the U. S. Air Force has a detachment. The Turkish Air Force also has an air-to-ground gunnery range parallel to the runway. When I stepped out of the plane one of their jets was starting a rocket pass. I thought for sure we were his targets.

We were glad to see U. S. personnel once again. Our stop was brief and soon we were off again for Izmir.

Izmir was our rest stop where for once we spent a peaceful night. It is a beautiful place on a bay overlooking the northern Mediterranean Sea. The big U. S. Air Force base there provided us with transportation into the city and the BOQ, which was a resort on the beach. This place had a very romantic look and was much better than our past few days' lodgings. Would you believe the International Fair was in progress and the city was full of festivities? We rode around the town after dark in a cute little one-horse buggy. We hated to leave when morning came.

We had a long haul over water with a few picturesque islands along the route. The Mediterranean Sea certainly is pretty and a lot cleaner than the water we had flown over previously. Once again we had the cockpit crowded with life-saving gear . . . you never can tell.

Land appeared, and just in the nick of time. We landed in Athens, Greece, avoiding some very bad weather. Here the merits of staying overnight were considerably better. The Air Force operates an officer's hotel which provides very comfortable accommodations and good food. I might add that all along the flight the stops provided good shopping for things you might never again get a chance to buy. The Air Post Office facilities scattered around the world are most helpful in sending all your "little goodies" back home.

We left the next morning enroute for what we called our first official stop on the European continent. There was more water in crossing the Adriatic Sea, but the islands were more frequent so we didn't require as much survival gear. Brindisi, Italy, was our refueling stop. Once again there was the usual arm waving, yelling and inquiries about why we landed there.

After refueling we were on our way to Pisa and U. S. Army Camp Darby—a welcomed stop. Darby has all the conveniences of a stateside assignment, and we had not seen that lately. Since we were

there only overnight a late evening visit to the Leaning Tower of Pisa was a must. Also, there was a quaint little tavern just across the street that no self-respecting aviator should miss.

Our most spectacular flight occurred the next day. We departed Pisa rather late and flew the coast line around the horn to Nice, France. The rugged mountains and beautiful villages were made for the eyes to behold as we passed such places as Monte Carlo and Genoa. I would say we were just about the right altitude to observe all the bikinis, and absence of bikinis, on the Riveria.

Nice is absolutely beautiful. The Otter looked a little out of place alongside the sleek civilian aircraft, international flights and Learjets, but we got out and in our baggy flight suits walked into the terminal with the best of them.

Nice as it turned out was *the* place to stay. The local citizens were having their annual celebration commemorating the ousting of the Nazis during World War II. They had quite a parade of beautiful girls and the most spectacular fireworks display I have ever seen. We agreed that this was a night to remember and by far the most interesting of the whole trip.

Early the following day we were ready to go again and we faced some difficult flying conditions. As everyone knows, the weather in Europe can become a real enemy. And too, the airways were much more crowded than to what we had been accustomed. We skirted along the western edge of the Swiss Alps. Those mountains are absolutely breathtaking but also very deadly. Without oxygen we did not dare try to cross them; from our view they were close enough. With a refuel in Lyon, France, we pushed on to Dijon to spend the night.

The next day we were off again and found one cannot afford the luxury of aviation sickness, known as "get-homitis." We realized that it would be a sad thing to come such a long way only to pile up at the end of the journey. Those last few hours are the most critical. One cannot afford to let up until the mission is complete.

Finally, about midday we hopped across the German border to Coleman Army Airfield, our final destination. We could hardly believe it . . . here we were after 9½ days and 55 flying hours at our final destination. Believe me, there were some sore muscles after that. All we wanted was a steak and a long night's rest.

Unfortunately, we found our troubles weren't quite over. It seems every little screw and bolt has to be accounted for, and if one thing is missing from the aircraft and not listed as such the personnel will not sign for or accept the plane. There was an untimely delay in cabling our element in Ethiopia to acquire the missing parts. The last thing we wanted after that long haul was static on the turn-in.

Looking back over the flight I find it not too boring. In those long hours aloft we made a game of figuring our action for each type of emergency possible. This kept us alert and prepared. It was a long, hard flight, yet the experience gained in those 10 days has been unequaled. The fact that precise and proper prior planning really pays off was a valuable lesson to me.

To those who might find themselves in the same situation, I advise you to do some homework. Good luck and have fun.

Unique Aviation Safety Inspection Team . . .

TRAVELS VIETNAM

William W. Johnson

FROM THE TIME the German Air Force developed its program of aviation safety and accident prevention to protect fighter pilots from the vicissitudes of aerial combat in 1914, aviators everywhere have searched for better operational safety methods.

Through the years a multitude of systems have been employed, ranging from strenuous preflight procedures to elaborate maintenance techniques. Regardless of the size, number of engines or load capacity of the aircraft the continual goal is to eliminate all chance of mechanical failure during flight.

For the most part the safety maintenance approach has been successful. However, there has always been the problem of high echelon operational safety within a hostile environment. Besides the obvious threat posed by enemy gunfire, shortages in manpower, time and equipment produce higher accident rates.

The author, now a civilian, obtained the information for this article when he was a combat correspondent with the USARV Information Office in the Republic of Vietnam

To solve this critical problem for Army aviators in the Republic of Vietnam, a unique aviation safety inspection (ASI) team was formed under the auspices of the USARV aviation office specifically to meet the challenge of identifying safety hazards throughout incountry aviation units, and to develop expertise in accident prevention under combat conditions.

Inaugurated in August 1970 from a concept advanced by Major General George W. Putnam Jr., then USARV aviation officer, the program expanded during the year to cover all organic and inorganic aviation units at detachment, company and battalion levels within Vietnam.

Under the next aviation officer, Brigadier General Jack W. Hemingway, the scope of the inspection team grew from a trial operation into an integral part of the aviation safety division. Further implementation and emphasis toward safety inspection occurred under Brigadier General Robert N. MacKinnon, when he assumed the duties of USARV aviation officer. Doctrine genesis and inspection techniques were formulated with guidance from Colonel Francis M. McCullar when he was the ASI team chief.

The ASI team is authorized five to seven members whose inspection duties cover aircraft armament systems, ammunition handling, POL operations, airport facilities, pilot training, standardization, maintenance, safety management, overall aircraft operations and planning.

ASI's mission is to provide the commander with an on-the-spot report on the condition of his unit's operational safety and the impact of on-going accident prevention programs that reduce flight hazards. In addition, the team attempts to discover potential aircraft accident factors and initiates action that eliminates the causes.

Normally a visit to a unit takes several hours with each member inspecting his area of specialty or specialties. At the end of the visit a debriefing session is held. Generally the unit commander, aviation safety

In fiscal year 1971 the team was credited with helping to save 58 lives and $21 million

officer, maintenance officer, instructor pilots and several other personnel responsible for aircraft operation are in attendance. Each team member then gives a critique on the respective sections that came under inspection.

When the team returns to Long Binh its members compare notes on the visit and prepare a formal report on operations that need improvement. The unit is allowed 15 days to initiate correction of deficiencies. After preparation and dispatch of the formal inspection report an evaluation of corrective action follows.

"The real purpose of ASI is to help USARV aviation units maintain a high safety record, not to pull hardcore inspections or nitpick a unit's operations," states Lieutenant Colonel James Massengill, who served as team chief the first year. "Our members are professionals that are adept at instruction and we place a great deal of emphasis on training personnel in proper safety procedures."

During fiscal year (FY) 71 the ASI team inspected 48 battalions, 160 companies and 30 detachments for a total of 238 units. All aviation units in Vietnam are inspected twice a year, with some receiving inspection more often where there are above average accident rates or known safety problems.

When a unit is selected for inspection a 24-hour notice is given to the commander and he is asked to have all safety, maintenance and operations personnel available and to have aircraft records and other data ready.

"Our job is not to throw out bouquets," explains Lieutenant Colonel Arnold Carrillo, USARV aviation safety officer and team chief for FY 72. "However, we do inform individuals when they are above the standard as well as when they are below accepted norms. If during the inspection we discover an item that is not acceptable, but can be corrected on the spot, we do not write it up.

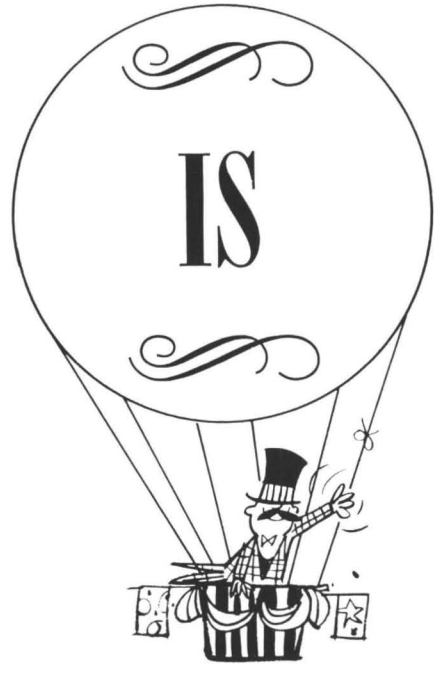
"Moreover, the ASI team does not give comparison ratings. There are no grades except for pass/fail. A great percentage of the discrepancies found can be ironed out or taken care of during the debriefing session. Quite often some of the most important details are presented during the critique by the NCOs who are intimately acquainted with the how's and why's of aircraft operations."

Review of the Army aviation accident experience during FY 71 and the attendant decrease in casualties in comparison with statistics from FY 70 portray why support for ASI has been so vigorous at command level.

During FY 70, for example, the accident rate was 22.2 per 100,000 flying hours. The rate during FY 71 decreased to 19.0 per 100,000 flying hours. This data can be correlated statistically to the saving of 58 lives and $21 million in aircraft equipment.

For FY 72 further emphasis will be placed on the concept of accident prevention through identification and correction at all levels. Lieutenant Colonel Carrillo says, "It has been found through experience that there is a direct correlation between a unit's command efficiency and discipline of operation and its safety posture."

HOW MUCH



ENOUGH?

(insurance--that is)

THE QUESTION often asked by aviation personnel is, How much insurance do I need? No one can answer this question without examining his present situation and his future demands. All that can be said is that an inventory of one's needs determines the amount of insurance that should be purchased.

Before deciding on a personal insurance program terms and definitions must be understood. Insurance salesmen are fond of using technical terms, but actually there are only four basic types of insurance that would affect the average individual: endowment, straight, term and limited pay.

Straight life is most popular of the four. With straight life premiums are paid on a regular basis until the person who is insured dies. When death occurs the beneficiary receives a settlement from the insurance company. A contingent beneficiary is often named in order to ensure a paid claim in the event of the beneficiary dying before a settlement can be made. The face value of a policy is the amount the beneficiary will receive on a claim of death.

Most life insurance policies have what is known as cash value (the amount received if the policy is discontinued). Insurance also may have a loan value (the amount that can be borrowed against the policy).

The cost of premiums depends on many factors such as age, health and occupation. Army aviators are usually young, healthy and mature which helps keep premiums from being too high. But since they are flying they have to pay some extra.

A nonflyer would pay about $7.50 a month for a $5,000 straight life insurance policy taken out at age 20. This amount remains constant for the duration of the policy. The cash and loan value, however, builds up year after year. At the end of 10 years a mature policy should have a cash or loan value of about $450. If by chance payments must be discontinued there are alternatives that can be taken—collection of cash value of the policy and thereby canceling out, or continuing a $5,000 protection without payments for a number of years by forfeiting the cash value. At age 40, for instance, protection could be discontinued until age 65 is reached. Another choice is to convert to a paidup policy and continue protection at a lesser amount for the duration of the insured's life. At age 40 a paidup policy of about $2,350 is realized.

As a military aviator, age 23, a premium of about $32 a month for a $25,000 policy would cover all aircraft accidents. Such policies are usually written with an aviation rider. Without this rider the cost would be about $22, but the policy would not pay in the event of an aircraft accident. The rider can usually be dropped when military flight is discontinued. A policy of this amount usually can be converted to about a $14,000 paidup policy at age 65 (minus the aviation rider). It also will have a loan or cash value of about $11,000 at that time.

Term insurance is usually a

temporary type of protection. A contract is written for a certain amount of insurance for 5, 10 or 15 years. At the end of this time renegotiation of the contract must be accomplished. Term is the least expensive insurance but under most circumstances the cost goes up each time the insurance is renegotiated, thus eventually it can become costly. For instance, term insurance is permitted in National Service Life Insurance (NSLI) which many still hold. However, the cost goes up every 5 years and by age 65 the premiums are so high that the insured finds it hard to make the payments. For this reason most holders of NSLI term insurance usually convert before they reach age 50.

Term insurance issued by civilian insurance companies does not necessarily allow renewal and conversion privileges. Check any term insurance before buying to be sure that these privileges are written into the policy.

Limited payment insurance is sometimes called a paidup policy. Essentially it is the same as a straight life policy except that premiums are paid only for a limited number of years. For instance, a 30-year policy at age 20 will be paid up by age 50. The premiums will be higher, but when the policy is mature no more premiums will be paid.

An endowment policy is like an insured savings plan. A certain amount is paid each month and when a preselected age is reached the policy becomes mature. If death should occur before that age the beneficiary is paid.

At one time it was hard for military personnel to get life insurance through a civilian company at a reasonable rate. Even today many companies have a war clause in their policies. Because of this the government intervened and offered life insurance at an inexpensive rate to servicemen and women.

One of the earlier programs called the United States Government Life Insurance (USGLI) was a permanent plan type insurance policy with a face value of up to $10,000. It was initially issued in 1919 and remained available to active duty personnel until October 1940 when it was replaced by NSLI. This coverage was available to active military personnel from October 1940 to April 1951.

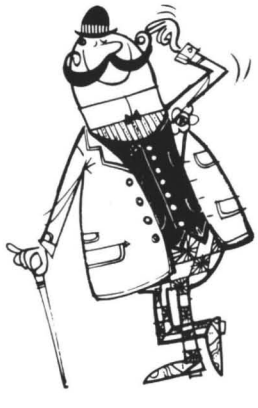
Up to $10,000 could be purchased with NSLI either as a 5-year level term or straight life insurance program. From April 1951 through December 1956 the government paid all premiums.

In January 1957 the dependency and indemnity compensation program (DIC) was introduced. In order to be eligible for DIC the insured had to resume paying his own NSLI premiums.

DIC is not strictly an insurance program but it is vital for the protection of dependents. Basically it provides payment on the basis of rank. Payments also are available to survivors of deceased retired members who die of diseases or injury incurred or aggravated in line of duty.

In September 1965 Public Law 89-214 authorized the Serviceman's Group Life Insurance which is the present coverage available. Initially it provided up to $10,000 in term insurance but the ceiling was raised to $15,000 in 1970. The insured is automatically covered by this program unless he elects otherwise. He may accept full coverage or reduced coverage in $5,000 increments. Payment for this insurance is deducted from the insured's pay at the rate of $1.00 each month for each $5,000.

After leaving the service the insured will be protected for 120 days without further payment of premiums. However, conversion of the policy during these days is anticipated. The converted policy is issued by one of the participating civilian insurance companies that underwrites the term program.



The ability to convert the policy when leaving the service is a valuable benefit. Conversion is guaranteed without physical examination at a premium based on age at the time of conversion. This means that while the premiums may be higher because of age, this right is guaranteed regardless of one's physical condition at that time.

Another protective program available to the military is social security. In 1957 all military personnel were brought under social security which offers both family protection and social security retirement benefits. Social security is not an insurance program, but it should be considered in the development of an insurance program.

Among the civilian insurance companies there are a number of special insurance programs designed for the military. These include life, automobile, home owner and even health designed to back up retired medical benefits.

Although these programs are not endorsed by the Army, they do provide major benefits. The low cost of the various group life programs can provide an excellent means of building a sizable insurance program with a low premium outlay.

Even a young man just out of school with no dependents, relatives or friends to leave money to needs insurance. It may not be much, perhaps just enough to create a small estate and take care of posthumous debts. For immediate needs the term insurance provided by SGLI is probably enough.

Try looking into the future and anticipating that a beneficiary might be desirable. A wife and perhaps some young ones

might have to be taken care of. When looking into the future the need of a small straight life insurance or perhaps a limited pay policy needs consideration. When young the premiums on a straight life policy are low which is an advantage. Also, if a limited payment policy is started at a young age it can be paid up in a few years.

The greatest need for insurance occurs when supporting a wife and children, at least until the children are grown. Then if the need arises a woman may work. Remember though that after years of taking care of children a woman's earning power will be much less.

Army aviators often quit flying following their obligated service. But while flying they desire extra protection. This is where a good term policy comes in handy. When the aviator has quit flying he may drop the policy. Another good use for this type insurance is protection of a debt. Suppose it is necessary to buy something that requires a large monthly payment and that a woman could not handle the payments alone. A term policy would pay for it. There are special term policies to pay off a mortgage on a house and there usually is a requirement to take a special term policy when buying an automobile on time.

Consider a 25-year-old man who intends staying in the Army for another 20 years before retiring. On Army pay more insurance can be afforded, but maybe not after retirement. A 20-year limited pay policy is best suited for this situation. Or suppose premiums are paid until age 65, but after that a premium would be hard to pay. Also, extra protection for the family now and a little extra pay after age 65 is desired. An endowment policy is the answer.

Here is how such a policy works: A 40-year-old man takes out an endowment policy for $16,000 paying about $55 a month. If he should die before age 65 his wife would receive $16,000 either in a lump sum or in monthly payments. If he should live until age 65 he would start receiving payments.

These are only examples of course. Everyone must determine which policy best meets his needs. Often a combination of plans may be the answer. Some companies offer what is called a family protection plan. This combines straight life with term and may be cheaper in the long run.

The following table can be used to help determine the amount of insurance needed:

AGE OF RECIPIENT	FACTOR
18-24	21
25-30	20
31-35	19
36-39	18
40-43	17
44-47	16
48-51	15
52-54	14

Example: A total of $30,000 in insurance policies will be paid a beneficiary upon death. Social security, DIC and other assets will pay $200 a month to the dependents, a 24-year-old woman and a 3-year-old child. To find out how much the dependents will get to live on in case of death, divide $30,000 by the factor opposite the woman's age. The figure will be about $1,428 per year or $119 per month. This plus the $200 from assets gives the dependents an income of $319. This may or may not be enough depending on various situations.

Here's another example: A wife is 30 years old. The husband wants her to have an income of $400 per month for the rest of her life in the event of his death. Investments, insurance and other sources of income along with the amount of money the wife can earn will bring $300 per month. She will therefore need an additional income of $1,200 annually ($400 - $300 = $100 X 12 months). Multiply the factor 20 by $1,200 and it can be determined that an insurance policy worth $24,000 is needed.

It must be remembered that there are provisions in DIC and social security to pay extra money to under age children and older children attending institutions of higher learning. This money will not continue to be paid after the children reach a

certain age or are graduated.

Also, it must be remembered that as insured and dependents grow older the value of insurance changes. For instance, in the second example the 30-year-old woman would receive $100 a month from an insurance policy of $24,000. At age 52 she would receive about $142 a month.

In conclusion, keep in mind that responsibilities are greater when the family is young. During this time a lot of insurance is needed. As the years pass responsibilities decrease and less insurance can be held. The time may even come when the only responsibility is to provide for a personal funeral. An insurance program should be tailored to reflect this.

McNair Versus The Bull

Continued from page 5

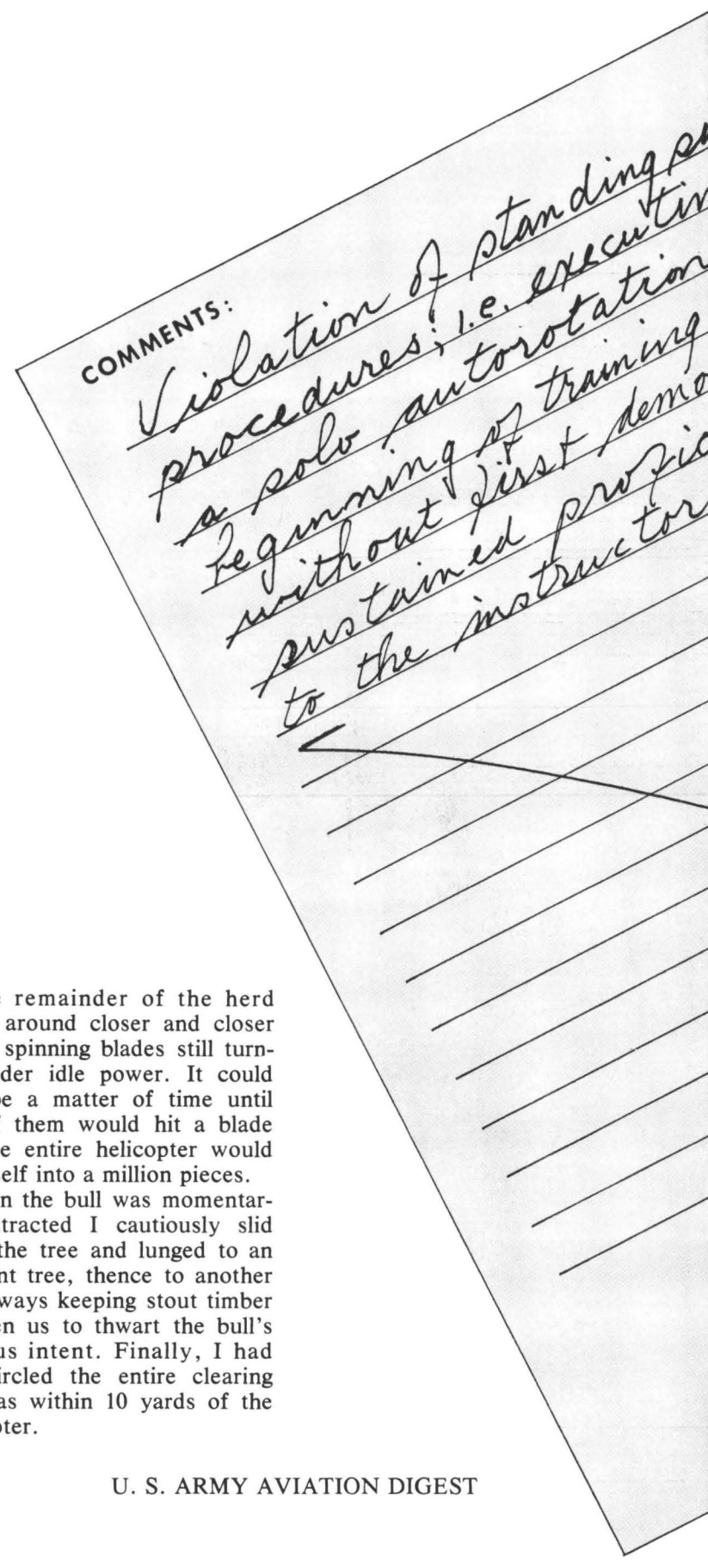
After pondering all these things I elected to do the only honorable thing and land at some intermediate point, unobserved and remove the pitot cover. Throughout the countryside there were small clearings designated for practicing confined area approaches. These areas were on private timberland or pasture but were leased by the government for student training. I spotted one of these clearings along my route and made a high reconnaissance. It appeared satisfactory except that there were cattle grazing in an adjacent clearing only a scant 100 yards away.

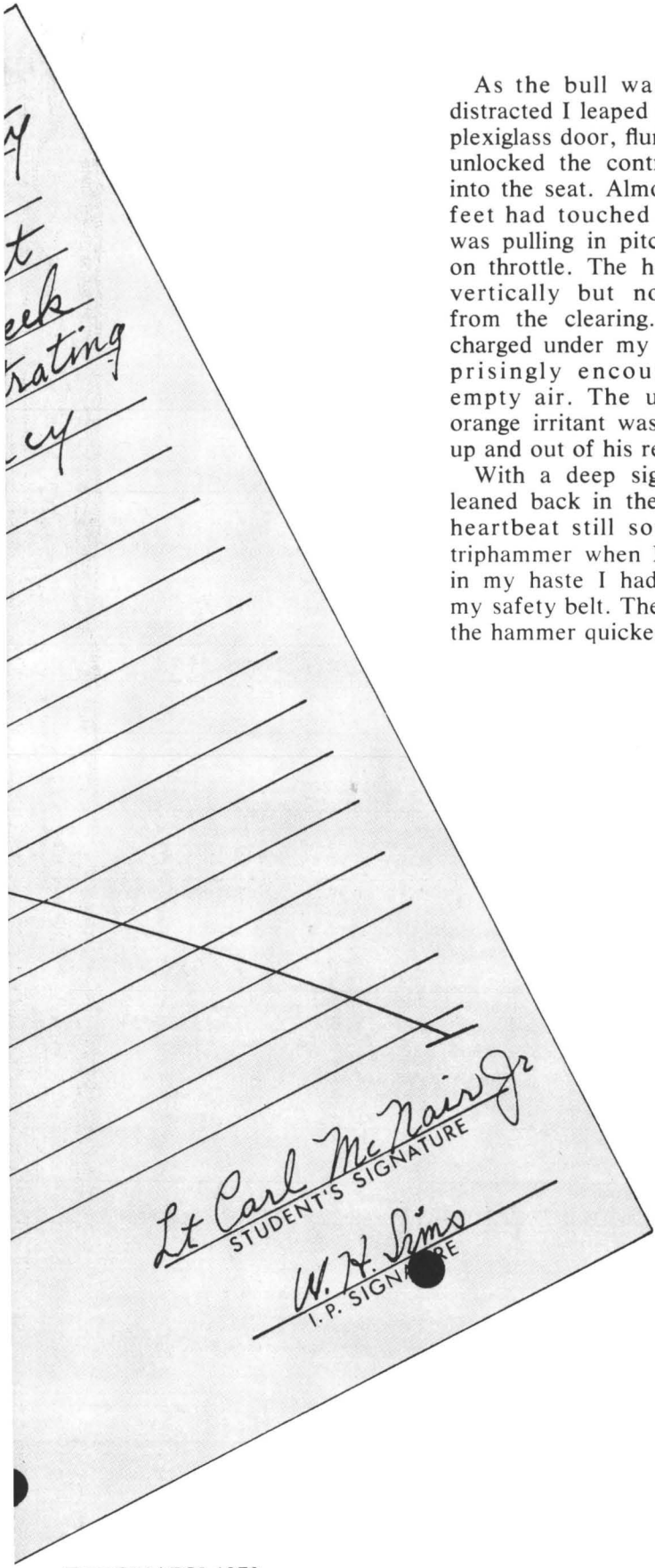
Feeling that I had an adequate margin of safety I descended steeply over the trees. With the helicopter sitting on a level piece of ground I locked the controls and jumped out to remove the forgotten cover. As I looked up from untying the warning flag, a helicopter flew noisily over the adjacent field and a few cattle began to move my way. Recognizing this as a potentially catastrophic situation should the cattle wander into the whirling rotor blades of my helicopter, my visions were of a bankrupt lieutenant paying for damages to both helicopter and cattle.

I moved quickly to meet the situation and approached the lead cow with my bright blue flight cap in hand, waving it violently to turn the herd away from the helicopter. It worked, the lead cow turned on me and gave chase, Only then did it dawn on me that this was not in fact a cow, but a large and blustery *bull.*

Moving with the agility of a track star, I made it to the nearest tree and shinnied up. The bull pawed the ground anxiously as the remainder of the herd milled around closer and closer to the spinning blades still turning under idle power. It could only be a matter of time until one of them would hit a blade and the entire helicopter would tear itself into a million pieces.

When the bull was momentarily distracted I cautiously slid down the tree and lunged to an adjacent tree, thence to another tree always keeping stout timber between us to thwart the bull's obvious intent. Finally, I had half circled the entire clearing and was within 10 yards of the helicopter.





As the bull was once again distracted I leaped madly for the plexiglass door, flung it open and unlocked the controls as I slid into the seat. Almost before my feet had touched the pedals I was pulling in pitch and rolling on throttle. The helicopter rose vertically but not gracefully from the clearing. As the bull charged under my skids he surprisingly encountered only empty air. The ugly whirring orange irritant was now moving up and out of his reach.

With a deep sigh of relief I leaned back in the seat but my heartbeat still sounded like a triphammer when I realized that in my haste I had not fastened my safety belt. The frequency of the hammer quickened.

In the normal conduct of flight in a helicopter, both hands and both feet are used to control and fly the machine. Only for brief intervals can one hand be taken from the collective pitch to tune a radio or adjust an instrument, but under no circumstances can one *ever* take both hands from the controls without cataclysmic results.

I now found myself relieved from the pitot cover problem and the subsequent encounter with the bull only to face another dilemma: How could I fasten my safety belt before landing at the stagefield? To chance an arrival in full view of my instructor with my safety belt flapping outside the door would surely result in a *pink slip.* This humiliation also could lead to the exposure of my two earlier goofs if an explanation were demanded as to why I was flying around without a safety belt firmly affixed around my posterior.

Collecting my thoughts I decided to land again and correct the discrepancy. This time I carefully selected an unused farm road without an animal of any description, be it male or female, in sight. I skillfully maneuvered the ship onto a wide place in the road where the skids fit neatly outside the ruts.

Everything seemed under control, so I elected to take advantage of the situation and recoup my badly shaken composure with a much needed cigarette break. I locked down the controls, walked about 50 feet away and spent the break time going over in my mind just what had gone wrong on this flight. Not only had my early oversight led me into a face to face encounter with a stern bull without a matador in sight, but my hasty departure without a fastened seat belt could have smeared me all over a wide swath of pine trees. I

chalked it all up to experience, confident that I had had three strikes for the day, was not out and, equally important to the morale of a trainee, had not gotten a *pink slip* for the day.

More confident than ever in my capabilities, judgment and skill, I took off and flew the few remaining miles to the stagefield. Buoyed up by my earlier evasions and anxious to give the "business as usual" impression to those on the field who were watching, I turned on the base leg calling for a touchdown autorotation. This poweroff emergency procedure disengages the engine and allows the helicopter to descend with lift generated by the freewheeling rotor blades. While an approved training maneuver, it is somewhat more risky than an ordinary landing and consequently had some restrictions attached to it which were momentarily dimmed by my complacency and overconfidence.

The autorotation itself was well done for a 15-hour student if I must say so myself. Yet, as I hovered to the parking area, I sensed that something wasn't right by the gait of the instructor as he walked to my parking spot. The look in his eye was more determined than that of the bull, and as the engine noise was dying away he didn't have to speak. On his clipboard he was inserting a very pink grade slip and beginning to write.

All manner of thoughts raced through my mind as I busied myself in the procedure of securing the electrical switches, radios and controls. Was it the pitot cover on takeoff? Was his dual instruction helicopter the one that flew over the cattle in the next field and then saw me up in the tree? No one had seen me land on the road or had they?

As I stepped from the helicopter my questions were immediately answered in language more representative of nautical personnel than aeronautical, but nonetheless effective in getting a message across. In brief it was Monday, an important fact which I overlooked mentioning earlier, but a very important fact for a student. We were expressly forbidden from performing autorotations after two nonflying days until we had first done a dual autorotation with the instructor on Monday.

As I read further down the pink grade slip not a word about the pitot cover, the bull or the road—just the simple statement: "Violation of standing safety procedures; i.e., executing a solo autorotation at beginning of training week without first demonstrating sustained proficiency to the instructor."

As my fellow students gathered around me inquiring, "What did he get you for?" my face was as pink as the slip. I wanted to tell how it took four strikes to get me out that day, but I knew deep down that I had struck out myself before I ever pressed the starter.

In a rationalizing way I tried to convince myself that I had skillfully overcome three problems which could have become more serious as well as very damaging to my professional pride in the presence of my fellow students.Thus, the bee came back to sting for that first mistake—not following the prescribed preflight inspection checklist. In no way could I rationalize away that responsibility and the possible consequences. A few weeks later I completed the transition training, not only as a qualified helicopter pilot but also as a more mature, more demanding, more conservative and consequently safer aviator.

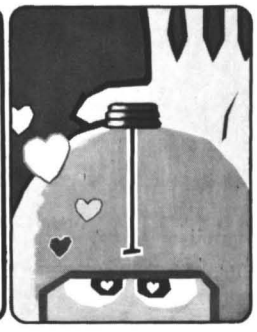
Ten years have now passed and I suppose if there is a statute of limitations on flying mistakes I hope I have passed it. But to this day I have never lost my appreciation for the lesson I learned from that chain of events which were triggered by a simple ground oversight before the flight began.

Today, as I conscientiously inspect the aircraft before I fly, other pilots sometimes ask why I bother when the crew chief or copilot has already made the checks. I simply say it's a habit of mine and go on about my responsibility. Even in Vietnam as unit commander with a very busy schedule and a full crew of gunner, crew chief and copilot at my disposal, I always took the time to check the vital parts. It's surprising how often you will find an oil cap not secured or a forgotten safety wire. Strange as it may seem, I even landed once at a major installation in a transient status and the main fuel tank was serviced with 50 weight oil. Had this not been discovered in draining the fuel pump I hesitate to think about the consequences when switching to the main tank.

Twenty-five hundred more hours have been added to my log since I learned that memorable flying lesson in Texas, yet the moral of that episode lingers with me. While the story itself is replete with personal embarrassment, I have told it frequently to other aviators—especially the young—hoping that they could reap the benefit without the chagrin which befell me. It has always been good for a laugh on the Old Man, and I only hope that it has had its intended effect of being good for a life which could be lost due to a faulty inspection blunder like I once made.

Continued from page 1

VIEWS FROM READERS



Would you please forward to me any such information available concerning the state of *Illinois*.

CW2 Robert C. LeVee
Quarters 7236A
Ft. Carson, CO 80913

Sir:

Please forward to the above address a list of Army Reserve and National Guard aviation units in the state of *Arizona*, along with a list of authorized slots and equipment.

Also, I would like to know if being in the National Guard or Reserves would affect the residency requirements with regard to tuition at a state college or university? Thank you.

CPT William H. Pennegan
8144 Calmont #140
Fort Worth, TX 76116

• At the present time there are no provisions in this area.

• The DIGEST nas received many inquiries in response to the July features on the Reserve Components. If you're planning on "getting out soon" and are thinking about joining the Reserves—write the DIGEST for a list of Reserve units in your state. Coming next month—an update on the status of the Reserve Components.

Sir:

On 11 September 1971 Major Dennis Engen, active Army advisor to the 92nd Aviation Company in Seattle, and CW2 Michael Lazares, a unit pilot, probably saved the life of an injured automobile accident victim.

They were flying a training mission during a week-end Army Reserve drill when they spotted an automobile accident north of the town of Roy near Ft. Lewis, WA. Noting the apparent seriousness of the accident, the pilots landed to see if they could be of assistance.

Due to the serious injuries of one of the accident victims, the pilots elected to medevac the man to St. Joseph's Hospital in nearby Tacoma. While CW2 Lazares, a Tacoma police officer in civilian life, piloted the Huey, Major Engen made radio calls, and the State Trooper on board administered first aid to the victim.

A hospital spokesman said the patient's life was probably saved by the officers' actions. It is doubtful the victim would have survived a long ambulance ride, as he was bleeding profusely and was unconscious.

Both officers were commended for their actions.

CW2 Ward L. Gabriel
Public Information Officer
92nd Aviation Company (ASH)
HANGAR 27, U. S. Naval
Support Activity
Seattle, WA 98115

Sir:

I am presently serving in the position as Chief, Defense Advisory Branch, United States Army, Japan. In this capacity I am responsible for advising and maintaining liaison with the Japan Ground Self Defense Force.

Currently the Japan Ground Self Defense Force is increasing the use of rotary wing aircraft in their tactical training and as a result are very interested in all aspects of helicopter operations.

I have been requested by the Japanese Headquarters in Tokyo to obtain a copy of an article by MAJ Jolley, "Formal Operational Authorization for Steep Angle GCA Operations at Hanchey Army Airfield" published in the April, 1967 AVIATION DIGEST.

Since this article is not available here in Japan, I am requesting your help in obtaining a copy for the Japanese. If available, please send the article to me for forwarding to the Japanese Ground Self Defense Force. Thank you for your kind assistance.

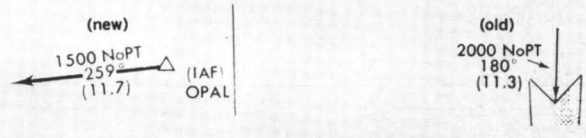
MAJ Guy E. Daines
Chief, Defense Advisory Branch

• A copy is in the mail.

INSTRUMENT CORNER

EACH MONTH significant changes are made to FLIP instrument approach charts that may go unnoticed. These changes are made to improve chart presentation and aid pilot interpretation of the procedure. Here are some examples of the more recent changes that are now appearing in FLIP.

1. Line weight of NoPT procedural track has been increased.



2. Distance associated with air speed and time for nonprecision approaches is changed as indicated below. Note too the change in air speeds.

(new)

FAF to MAP 2.3 NM					
Knots	60	90	120	150	180
Min:Sec	2:18	1:32	1:09	0:55	0:46

(old)

VORTAC to Missed Approach 6.8 NM					
Knots	70	100	125	150	165
Min:Sec	5:50	4:05	3:16	2:43	2:28

3. When the term "Radar Vectoring" appears in the upper left corner of the chart, the pilot may expect radar vectors for that approach.

4. For approach procedures where straight-in minima are not authorized, the procedure titles will include the letters A, B, etc., as indicated in this example.

VOR-A VOR-B

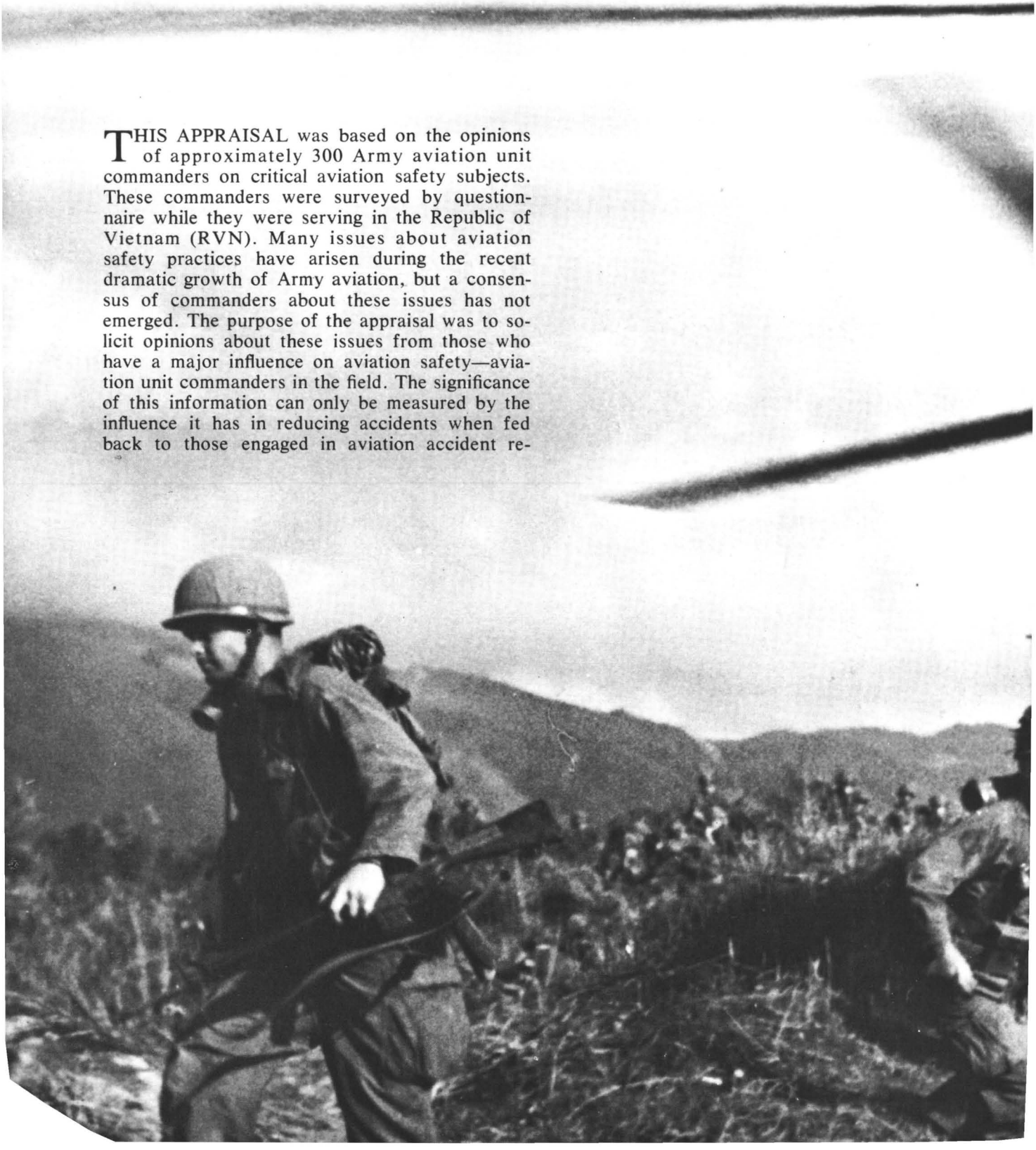
Remember, this does not prevent a straight-in landing if it is within the capability of the aircraft and pilot.

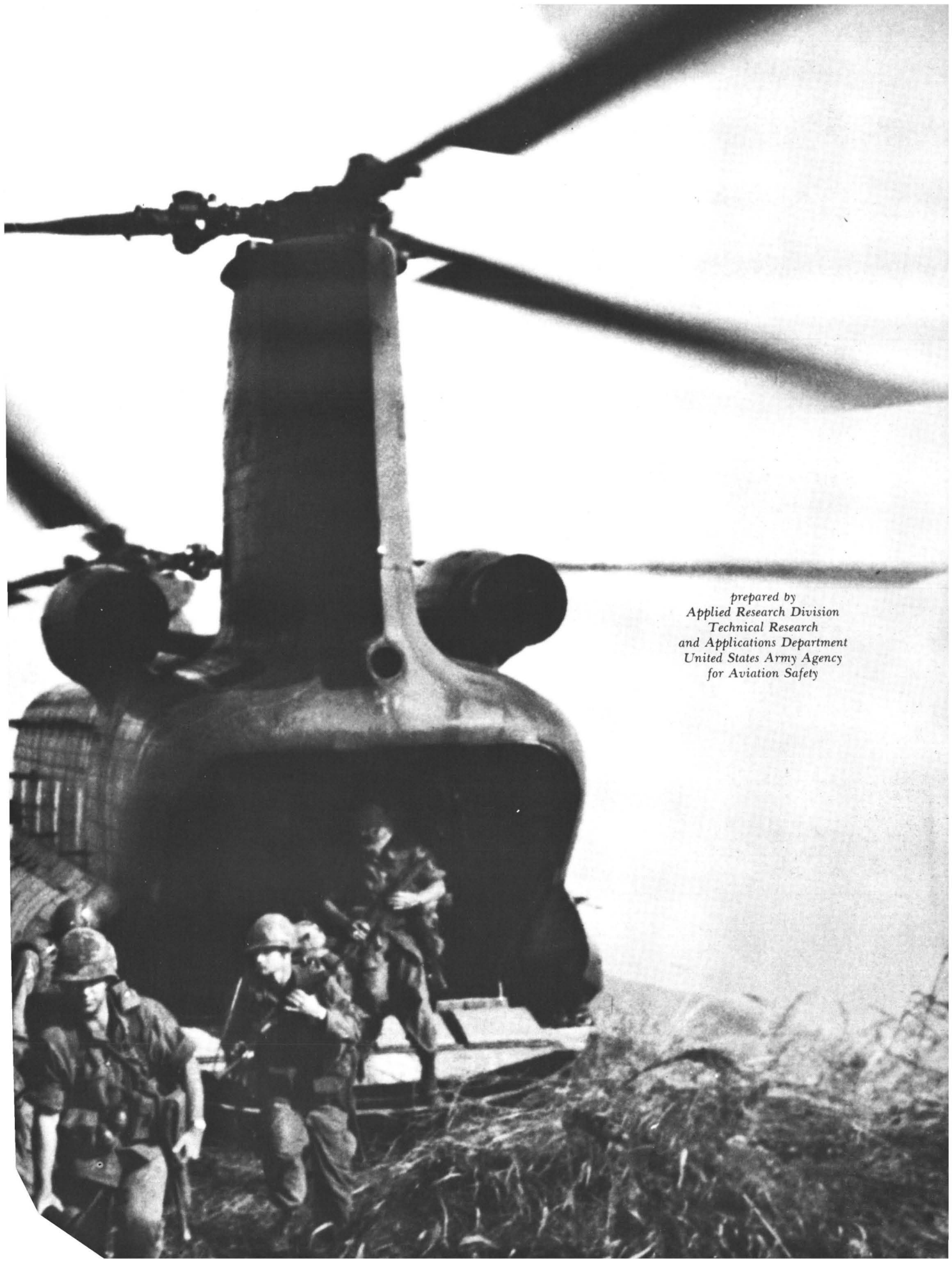
Adapted from USAAAVS Technical Report 72-2, October 1971

Aviation Safety In Combat

An Appraisal of the Experiences of Army Aviation Unit Commanders in RVN

THIS APPRAISAL was based on the opinions of approximately 300 Army aviation unit commanders on critical aviation safety subjects. These commanders were surveyed by questionnaire while they were serving in the Republic of Vietnam (RVN). Many issues about aviation safety practices have arisen during the recent dramatic growth of Army aviation, but a consensus of commanders about these issues has not emerged. The purpose of the appraisal was to solicit opinions about these issues from those who have a major influence on aviation safety—aviation unit commanders in the field. The significance of this information can only be measured by the influence it has in reducing accidents when fed back to those engaged in aviation accident re-





prepared by
Applied Research Division
Technical Research
and Applications Department
United States Army Agency
for Aviation Safety

search and to unit commanders and aviation safety officers in the field.

A questionnaire was developed by which the opinions of aviation unit commanders and aviation safety officers could be solicited concerning major aviation safety issues. Issues resulting in specific items for the questionnaire were selected from RVN oriented safety conferences, interviews with returning aviators and corrective-measure comments from accident reports. Three forms of the questionnaire were developed—AC and BC for unit commanders and AA for aviation safety officers (ASOs). Forms AC and BC contained 73 questions, of which 24 asked background information. The remaining 45 questions concerned aviation safety issues and required a response of (a) strongly agree, (b) agree, (c) undecided, (d) disagree, or (e) strongly disagree. These two forms were identical, except that form AC stated questions positively and form BC stated questions negatively. This procedure was used to ensure that—should positive or negative wording influence responses to questions—bias would be cancelled out by using responses from both forms. However, no such bias was revealed and both forms were considered reliable.

Form AA (ASOs) included 100 questions, of which 21 requested background information and 79 sought aviation safety information. Among the 79 safety questions, 13 were the same as those asked of commanders and were included to obtain a comparison of opinions between ASOs and unit commanders on issues of mutual interest. ASO responses were not used in determining cumulative response percentages for commanders or the median.

The exact number of unit commanders and ASOs in RVN during the period March-July 1970 could not be determined due to continuous turnover. Therefore, the commander and ASO strength of 156 aviation units in RVN was estimated and a total of 1,141 questionnaires was mailed (399 AC, 399 BC and 343 AA), with instructions to distribute one questionnaire to each ASO unit commander from brigade to platoon level. Of the questionnaires distributed, 155 of form AC (39%), 142 of form BC (35%) and 131 of form AA (38%) were returned. Since the number of unit commanders and ASOs in the 156 units receiving questionnaires could not be determined, the percentages of all such personnel represented by this sample are unknown.

Figure 1 presents background descriptions of responding commanders. Each table shows a distribution of the 297 commanders by levels of command and the percentage each level represents of all responding commanders. Each table shows platoon commanders (152) are the largest group (49.5%) of the sample. However, had the sample been precisely apportioned by command level, this group would have been even larger, so the sample can be viewed as representative of commanders at each level within aviation units in RVN. All background information collected from the questionnaires is not shown in figure 1 and some of the following descriptions are based on this unreported information.

Platoon Level. Platoon commanders surveyed were mostly young aviator rated captains who had completed about 3 years of Army service. Most of their time in service had been spent as rotary wing (R/W) aviators and they were currently qualified to fly only the aircraft they piloted in RVN. If qualified to fly fixed wing (F/W) aircraft, they generally flew the 0-1. They had completed more than half of their first 12-month combat tour, spending most of this time as platoon commanders.

Company Level. Company commanders surveyed were mainly majors, had been aviators about 8 years, were dual rated and on their second combat tours. They were probably platoon-commander captains during their first combat tours and had completed 75 percent of their current RVN tours. They had been company commanders for 4 months, revealing a rotation time of approximately 6 months.

Battalion Level. Other than rank and years rated, the 25 battalion commanders surveyed did not appear significantly different from their counterparts at company level. They were lieutenant colonels who had been rated aviators about 12 years and their current combat tour was their second. Only one had served more than two full tours, while three platoon and five company commanders had completed more than two combat tours.

Brigade Level. Only four brigade commanders were surveyed. All were full colonels and dual rated aviators, two for 9 years and two for 12. One had more than two combat tours, two were on their second tours and one was on his first. Two had completed half their current tours and none had more than 6 months in his present command.

Unreported Level. Of the commanders surveyed, 20 did not report command levels. Of this group, 11 captains may have been detachment commanders. One colonel and four majors served at unknown levels. Nevertheless, the responses

FIGURE 1
BACKGROUND OF RESPONDING COMMANDERS

Level of Command	CPT	MAJ	LTC	COL	% of Total
Brigade or Battalion	0.0%	0.0%	92.5%	80.0%	10.5%
Company	6.5	92.0	7.5	0.0	34.5
Platoon	86.5	3.5	0.0	0.0	49.5
Level Unreported	7.0	4.5	0.0	20.0	5.5
% of Total	**55.5**	**32.5**	**9.5**	**2.0**	

Years as an Army Rated Aviator

	Less than 3	3 but less than 6	6 but less than 9	9 but less than 12	More than 12
Brigade or Battalion	0.0%	0.0%	0.0%	11.5%	73.5%
Company	3.5	31.5	91.5	83.0	17.5
Platoon	83.0	59.0	6.5	0.0	6.0
Level Unreported	13.5	9.5	2.0	5.5	3.0
% of Total	**47.5**	**14.0**	**15.5**	**12.0**	**11.5**

Months in Command

	Less than 3	3-6	7-8	9-10	11 or more
Brigade or Battalion	6.5%	16.0%	4.0%	0.0%	0.0%
Company	25.0	43.0	30.5	20.0	50.0
Platoon	60.0	39.5	61.5	80.0	50.0
Level Unreported	8.5	1.5	4.0	0.0	0.0
% of Total	**42.0**	**44.0**	**8.0**	**3.5**	**1.5**

Type of Mission

	Cargo	Utility	Observation	Attack
Brigade or Battalion	20.5%	41.5%	10.5%	27.5%
Company	27.5	26.5	31.5	14.5
Platoon	20.5	24.5	28.0	26.5
% of Total	**22.0**	**27.0**	**28.5**	**22.0**

Number of Tours in RVN

	Less than 1 full tour	1 tour now in 2nd tour	2 full tours	More than 2 tours
Brigade or Battalion	2.5%	14.0%	0.0%	17.0%
Company	5.5	47.5	71.5	41.5
Platoon	77.5	33.0	28.5	25.0
Level Unreported	14.5	5.5	0.0	16.5
% of Total	**37.5**	**56.0**	**2.5**	**4.0**

Months Remaining in This Tour

	Less than 3	3-6	7-8	9-10	11 or more
Brigade or Battalion	10.5%	11.5%	12.0%	2.5%	7.0%
Company	34.5	38.0	29.0	13.0	28.5
Platoon	51.5	39.0	48.5	71.0	43.0
Level Unreported	3.5	11.5	9.5	13.0	21.5
% of Total	**36.0**	**32.5**	**14.0**	**12.5**	**4.5**

from this group are considered as valid as those from other commanders and are included.

Only the positive form of each question is presented because no differences were found between responses to positively (AC) and negatively (BC) stated questions. The most outstanding features of the results are presented in several major sections. Within these sections, questions of similar topics are grouped for discussion. At the end of each major section, conclusions are made and the questions from which they were drawn identified in parentheses.

Unit Aviation Safety Enforcement. The seven questions of this section probe unit safety enforcement by asking who is responsible for safety attitudes; why these attitudes exist; and what can be done to enforce aviation safety.

Question 1. "The inexperienced aviator's attitude toward aviation safety is a reflection of the flight procedures and practices the unit employs to accomplish its operational missions."

The purpose of this question was to verify a long standing assumption that the safety attitudes of inexperienced aviators are highly influenced by practices they observe and procedures they are required to follow during operational unit assignments. A large majority (75.5%) of commanders agreed with this statement. Its validity is strengthened in that those in charge of assimilating new aviators into units (platoon and company commanders) expressed strongest agreement. Development of the proper attitude toward aviation safety is a prime objective of the unit assimilation process and platoon/company commanders have the closest view of this developmental process.

Question 2. "The flight procedures and practices that the unit employs to accomplish its operational missions are a reflection of the unit commander's attitude toward aviation safety."

Responses to question 1 indicated that a unit's procedures and practices influenced aviators' safety attitudes. Question 2 asked who is responsible for these procedures and practices. Responses evidenced that commanders (87.5%) and ASOs (93%) strongly agreed that a unit's safety procedures and practices reflect the commander's attitude toward safety. In effect, then, unit commanders can determine the safety attitudes new

Most commanders recognize the effect of combat stress on accident rates, but are not willing to trade safety for mission accomplishment and are striving to do something about it

aviators develop and probably retain throughout their careers. There is evidence in Army aircraft accident files that inexperienced aviators may take a commander's casual remark about a flight procedure as license to trade off safe flight principles for mission accomplishment. Commanders must constantly be aware of the impact carried by their words, actions and even their mannerisms.

Question 3. "In a combat environment, a higher accident rate should be accepted as well as expected."

Question 4. "Only when an accident occurs do safe operations receive sufficient emphasis."

Responses to question 2 indicated that commanders' attitudes are responsible for unit safety practices and procedures. Questions 3 and 4 then asked what these attitudes actually were on two basic issues. Question 3 is two-pronged, based on the assumption that the violence, added hazards and uncertainty of combat environments put a great deal of stress on aviators and lead to higher accident rates. Assuming this would be verified, the intent of the second prong was to determine whether commanders would simply accept such higher accident rates in a tradeoff between mission accomplishment and safety. Surprisingly, 67.5% of the commanders indicated they might expect higher accident rates, but would not simply accept them. This is encouraging when interpreted to mean that most commanders recognize the effect of combat stress on accident rates, but are not willing to trade safety for mission accomplishment and are striving to do something about it. However, a significant number (30%) of the commanders revealed they expected and accepted higher accident rates in combat. This group is sufficiently large to account for increases in accident rates which always seem to accompany flight operations in combat. The reason for this group expecting and accepting higher accident rates probably results from some combination of: (a) inexperienced aviators; (b) difficult terrain turning forced landings into accidents; (c) combat stress on aviators; (d) command assignment too short to structure and implement a good accident prevention program; and (e) management and command shortcomings. Nevertheless, all commanders should recognize the safety hazards of combat

environments and strive to overcome them by improving their accident prevention programs.

Question 4 also had a dual purpose. First, it is a well recognized human characteristic to "oil the wheel that squeaks." This problem is not exclusive to Army aviation. Therefore, the first purpose of question 4 was to determine how widespread this tendency was among aviation units in combat. Surprisingly, 35% of the commanders told on themselves by agreeing that safety receives sufficient emphasis only after accidents occur. Commanders with this opinion were distributed rather evenly over different levels of command, indicating that either the tendency to oil the wheel that squeaks is a stable phenomenon or that only 35% of the commanders were willing to tell on themselves. Unfortunately, many (60%) of the commanders disagreed with the statement and Army aircraft accident files contain ample evidence of aviator/aircraft losses resulting from this attitude. The second purpose of this question was to compare responses of commanders with those of ASOs. It was anticipated that some disagreement would be evidenced. The results again were surprising, this time because of close agreement (33% agreed and 53.5% disagreed) between commanders and ASOs. This close agreement lends support to the hypothesis that oiling the wheel that squeaks is a stable phenomenon. But it may also be interpreted to indicate that only 33% of the ASOs were willing to admit shortcomings of their unit accident prevention programs.

Question 5. "To be effective, an accident prevention program, in addition to being well conceived and publicized, needs to be vigorously enforced."

Question 4 asked when the commanders devoted emphasis to safe aviation operations and question 5 asked how much they recommended enforcing this emphasis. Responses to question 5 (92% agreement) disclosed a dramatic shift toward recognizing the need for strong enforcement of accident prevention programs. In the past, the only enforcement evidenced in aviation safety was "appropriate actions," taken when blatant neglect resulted in accidents. That mode of enforcement was prevalent early in the RVN conflict when aviators were in short supply and allowed considerable latitude regarding safety practices. However, violations which were then simply overlooked now warrant appearances before flight evaluation boards. This increased scrutiny is reflected by responses to question 5 and reveals a replacement of the forgive-and-forget philosophy with one depending on vigorous en-

The tendency of aviators, especially inexperienced ones, to take unnecessary risks to accomplish missions is very real

forcement of safety programs before accidents occur.

Question 6. "Wise application of the collateral investigation system would be helpful to the aviation safety program."

Question 7. "The assignment of an aircraft accident rate ceiling, which considers the relative hazard of each unit's operation, is a sound management practice."

Responses to question 5 indicated responding commanders overwhelmingly support the idea of vigorous enforcement of accident prevention programs. The purpose of questions 6 and 7 was to determine their opinions about two methods of enforcing these programs. Question 6 probed the usefulness of collateral investigations which are a commander's prerogative and can lead to punitive actions where aviator negligence is suspected in accidents. Of all the commanders, 62.5% agreed these investigations would be helpful to aviation safety programs, but the amount of agreement decreased at lower command levels. Several possible reasons for commanders at lower levels being hesitant to subject fellow aviators to such scrutiny and possible punitive action exist. These are: (a) lower level commanders are closer in age, rank, experience and physical contact with aviators and may be reluctant to bring action against their near peers for performance they themselves might not have been able to improve; (b) hearsay knowledge of the conduct and consequences of collateral investigations may have resulted in a fear of these actions; or (c) as a method for enforcing aviation safety programs, collateral investigations might not be the best means of enforcement. Regardless, commanders, especially at higher levels, lent support to the use of collateral investigations for enforcing safety programs.

FIGURE 2
How Answers to Each Question Were Tabulated in Percentages

QUESTION 29. Individual aviators, more so than the unit commander, seem to be willing to accept unnecessary risks to complete a mission.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	31.0%	51.5%	7.0%	10.5%	0.0%
Company	26.0	46.5	7.5	18.0	2.0
Platoon	24.5	46.5	5.5	18.0	5.5
Level Unreported	11.0	26.0	11.0	29.5	22.5
All Commanders	24.5	45.0	6.5	18.5	5.5
ASO's	30.0	39.0	4.0	20.0	5.0

Question 7 asked for opinions about accident rate ceilings as a method for enforcing safety programs. The criterion is a given accident rate for each unit based on the risks involved in the unit's operations. Essentially, commanders were undecided on the worth or practicality of this method of enforcement (54.5% against, 19.5% undecided and 26% for). It should be noted, however, that the largest negative reaction (41% strongly disagreed and 24% disagreed, total 65%) came from brigade/battalion commanders. This response of higher level commanders is not surprising for two possible reasons: (a) it may be recalled that high level commanders overwhelmingly (99%) supported vigorous enforcement of accident prevention programs (question 5); they strongly (75%) supported collateral investigations of aviator negligence (question 6); but in the case of accident rate ceilings (question 7), where they would be directly responsible for the failure or success of accident prevention programs, 65% were against such a method of enforcement; and (b) in all fairness to the commanders, it is recognized there is rapid turnover in command assignments in RVN and, where units do not have established and effective accident prevention programs, it is extremely difficult for new commanders to analyze accident situations, set up effective programs and adjust them as accidents occur, all within a few months. It appears the only way accident rate ceilings could be accepted and used as a method of enforcing accident prevention programs is after sound and effective programs have been established for each unit. Commanders are understandably reluctant to take responsibility for unsatisfactory safety programs established by others. However, where unsatisfactory unit programs exist, some authority has to recognize such programs and take necessary steps to improve them, even if it means removing commanders.

Conclusions:

(1) The safety attitude of inexperienced aviators

AVIATION SAFETY IN COMBAT
is highly influenced by unit practices and procedures and, aside from flight school, the unit is the best place to develop proper safety attitudes.

(2) Unit commanders form the safety attitude of inexperienced aviators because they control unit safety practices and procedures.

(3) In combat environs, commanders expect, but do not accept, higher accident rates. They are, therefore, not willing to trade safety for mission accomplishment.

(4) A surprisingly large number of commanders (35%) and ASOs (33%) agree that safety receives sufficient emphasis only after accidents occur, lending support to the hypothesis that a tendency to "oil the wheel that squeaks" is a relatively stable phenomenon.

(5) Agreement among 92% of the commanders disclosed a dramatic shift away from the forgive-and-forget philosophy about accidents, and toward recognition of the need for vigorous enforcement of accident prevention programs.

(6) Of all commanders, 62.5% agreed collateral investigations were a useful method for enforcing safety programs, but the amount of agreement decreased with decreasing command levels.

(7) As a second method for enforcing safety programs, commanders did not approve (54.5% against, 19.5% undecided and 26% for) of assigning accident rate ceilings to each unit.

Safety Training Requirements of Aviation Units. The previous section focused on enforcement of safety at unit levels in determining who was responsible for forming safety attitudes, why the attitudes exist and what should be done to im-

Aviation unit commanders overwhelmingly agree that ground commanders need further training in aviation operations

prove them. One of the major findings was that aviators' attitudes toward safety are significantly shaped by unit experiences. It follows that if proper safety attitudes are not shaped by the time aviators are assigned, safety training requirements have gone lacking and need to be satisfied somewhere other than during combat. This section investigates these requirements and suggests possible remedies.

Question 8. "Individual aviators, particularly those at unit level, do not have a good understanding of the Army's aviation accident prevention program."

If aviators are to develop a proper attitude toward aviation safety, they should understand the Army's overall concept of safety (encompassing entire aircraft life cycles) and know their role in the program. However, 55.5% of the commanders and 67.5% of the ASOs agreed that aviators do not have a satisfactory understanding of the global Army program. Among commanders, this belief is most prevalent (72.5%) at brigade/battalion level. If aviators at unit level do not have a clear view of aviation safety's overall program, it is easy to understand why aviators fresh out of flight school can have their attitudes swayed by risky unit practices and even casual remarks by unit commanders. In this same light, it is also easy to understand difficulties experienced by commanders and ASOs in enforcing unit accident prevention programs. If aviators do not have a solid foundation in aviation safety, it will be difficult for them to understand safety at the unit level and to ensure their compliance with safety procedures formulated by particular units.

Question 9. "The Army's aircraft accident prevention program should be taught as a subject during flight school."

Responses to question 8 revealed aviators do not have a sufficient understanding of the overall aviation safety program. This finding, along with those of the preceding section, suggests that units have enough trouble teaching and enforcing their own safety programs, without the handicap of aviators who do not have a good basic understanding of aviation safety. Question 9 asked where aviators should be given this basic understanding. Overwhelmingly (92.5%), the commanders agreed the Army's accident prevention program should be taught as a subject during flight school. The few disagreeing may have reasoned that the hectic forced pace schedule of training during flight school cannot stand yet another subject. However, additional time required by an Army-wide aviation safety course could prove significant to unit safety programs by reducing accidents and increasing mission accomplishment.

Question 10. "Monthly safety meetings with mandatory subjects should be abolished in favor of more frequent informal discussions of current unit safety problems."

In questions 8 and 9, commanders agreed that aviators do not have a basic understanding of the Army's safety program and it should be the topic of a course taught in flight school. Question 10 seeks to reveal a further dimension of the problem by asking if monthly safety meetings are compromised by set mandatory subject matters that should be taught in flight school and whether these meetings should be changed to more frequent informal information exchange discussions of unit safety problems. To this dual question, the single response (61%) was yes.

From questions 8 and 9, it is clear that commanders recognize a need for formal safety training and feel it should be a flight school subject. The response to question 10 verifies that they feel basic safety subjects are topics for flight school and should not consume monthly safety meetings where pressing matters of unit safety require an undivided exchange of views and experiences. The disagreement (32%) evidenced perhaps reflects the opinion of commanders who, through careful planning and execution, are able to successfully combine formal subject matter and current unit safety problems. However, the responses indicate these commanders are in a definite minority and most can ill afford the time and effort required to teach subjects in combat settings that should be taught in school.

Question 11. "Ground commanders need additional training in aviation operations such as loading of troops, preparation of PZs, selection and training of padmasters, observation and reporting of weather conditions, etc."

The subject of question 11 diverges from the other questions in this section, but it does concern unit training and requires responses from aviation unit commanders who are most familiar with the problem and its results in terms of accidents. Commanders strongly agreed (92%) that ground commanders need additional training in aviation operations. Close and coordinated interaction between aviation and ground personnel is

Continued on page 56

Nomex Underwear

This unit is a VIP flight detachment supporting a major command. We are required to wear the class "A" (AG-44 or khaki) uniform for all flights transporting General/Flag officers or equivalent civilians. The majority of our flights fall in this category.

I recently obtained information about the availability of Nomex underwear from Atlas-A Company. The price quoted for the shirt was $6.25; trousers, $5.75; and socks, $2.00.

AVIATION ACCIDENT PREVENTION FORUM

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

Do you have any information about Nomex underwear, such as protection afforded, availability through normal supply channels, provisions for funding purchases and alternate supply sources at more reasonable prices?

If we are unable to obtain flame-retardant underwear through supply channels, we hope to be able to fund them through local procurement channels. The information requested will enhance the possibility of approval for this procurement.—CWO, ASO

With respect to protection afforded by Nomex underwear, USAAAVS is not aware of any experimental work or data collection regarding the flame protection of Nomex underwear worn under standard Army uniforms. Results of a recent US Army Aeromedical Research Laboratory study, "Knox, Et. Al.," tend to indicate the best flame protection is obtained through a combination of standard Army 50-percent cotton/50-percent wool underwear worn under the standard Nomex flight suit. This protection is equal to or better than that provided by the experimental Nomex underwear worn under the Nomex flight suit.

There is no authorization (TDA, TOE, etc.) for Nomex underwear. Authority may be obtainable through a special letter of authorization submitted through channels, with complete justification for the item. Nomex underwear is not available through normal Army supply channels. Final determination of the flight clothing system may or may not include Nomex underwear.

Additional sources of supply for flame-retardant underwear include but are not limited to Sears and Penney's. Their prices, however, are higher than those quoted in your letter and current availability is unknown.

We checked with a representative of the US Army Aeromedical Research Laboratory, and it is his opinion that if the class "A" uniform must be worn in lieu of the Nomex flight suit, the best protection can be obtained through the wear of Army issue (all wool) class "A" uniform with Army standard long underwear.

Both USAARL and USAAAVS recommend that under no circumstances should the outer uniform be of the type that uses nylon, orlon, rayon or any other man-made fibers. When exposed to heat, these fibers melt, forming a molten mass.

Survival

Recently I ran across an article on survival with your address. I am very interested in survival and would appreciate any assistance possible in helping locate information on survival, survival training, equipment used and the uses of this equipment.

My sources seem to be very limited so far. There isn't much written about it.—Civilian reader

Thank you for your letter and your interest in survival and survival equipment. Your letter does not indicate a military affiliation or connection which would permit us to send you the pertinent government publications. Therefore, we offer the following information on how a member of the civilian community can obtain military publications relating to survival.

Department of the Army Field Manual, FM 21-76, and Department of the Air Force Manual, AFM 64-5, both deal exclusively with survival and are available for purchase at a cost of $1.00

each from the Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402.

Periodicals are published by each of the three services and cover all facets of aviation safety, including survival and survival equipment. These are listed below and are available by subscription from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

(a) U.S. ARMY AVIATION DIGEST, $4.50 per year (domestic rate)

(b) AEROSPACE SAFETY (U.S. Air Force), $4.00 per year (domestic)

(c) APPROACH (U.S. Navy), $7.00 per year (domestic)

Civilian publications on survival and survival equipment and training appear to be few. At this writing, only one such periodical is available in our library, SAFE Engineering, which is the journal of the Survival and Flight Equipment Association and is published bimonthly by Value Engineering Publications, Inc. There have been a few books written on the subject, however, and in recent weeks, one of the sportsman magazines has published a good, well-illustrated volume. Perhaps your local library may be a possible source of material.

Insignia

In response to many queries about whether enlisted flight crew members should be allowed to wear cloth insignia on their Nomex flight suits, USAAAVS' position is that cloth insignia sewn on flight suits are preferable to metal pin-on insignia from a safety standpoint. Pin-on insignia are a source of FOD and of injury to face and neck in crash or postcrash escape sequences. Further, they present a definite entanglement hazard for shoulder harness, communication cords and personal equipment. The nature and location of sewn-on insignia are not considered significant from a safety standpoint.

Publications

We've also had many queries about available aviation safety publications. In addition to weekly and monthly mishap summaries, the following publications are currently available from USAAAVS. Army units may obtain copies by writing to: CO, USAAAVS, ATTN: E&P, Fort Rucker, Alabama 36360.

- *Guide to Aviation Resources Management for Aircraft Mishap Prevention, Second Edition—This booklet was prepared for commanders, staff officers and leaders of the varied activities in Army aviation. As its name implies, it serves as a guide for preventing aircraft mishaps through the judicious and skillful use of aviation resources.*
- *Sample Aviation Accident Prevention Program—1971—From submissions of aviation accident prevention programs of units throughout the Army, this pamphlet was developed to help aviation unit commanders and safety supervisors to implement effective accident prevention programs.*
- *Technical Report 72-2, October 1971, entitled Aviation Safety in Combat—Based on an appraisal of the experiences of Army aviation unit commanders in RVN, this publication discloses an analysis of commanders' opinions about critical aviation safety issues arising during Army aviation's dramatic growth in response to demands of the conflict in RVN.*
- *OH-58 Accident Summary—This summary includes statistics, analyses and selected mishap briefs for the period May 1969 through February 1971.*

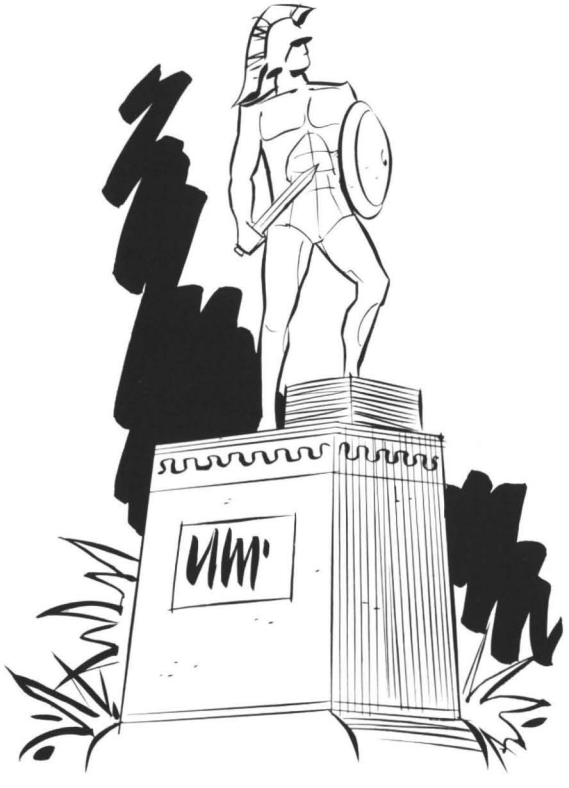
Readers are invited to participate in this forum. Send your ideas, comments and recommendations to USAAAVS Fort Rucker, Al. 36360

- *Technical Report 71-1, Army Midair Collisions—This report contains analyses of 56 Army midair collisions which occurred during the period January 1963-November 1969 and conclusions and recommendations based on the analyses.*
- *Technical Report 72-1, Army Helicopter Terrain Collision Study—This study contains analyses of 836 Army helicopter collisions with terrain obstacles during a 1-year period. It summarizes major cause factors on a worldwide basis and presents recommendations to prevent recurrence of similar type mishaps.*
- *Flight Surgeons Newsletter—This publication, to be published four times each year, will contain items of interest to flight surgeons in the areas of aviation safety, human factors, life support equipment and aviation medicine. Flight surgeons who wish to receive this publication may do so by writing to the above address.*
- *Technical Report 71-2, Wire Strike Report—This report identifies factors and circumstances which caused or contributed to Army aircraft wire strikes. The information it contains was updated in:*
- *Preventer, the first issue of the Aviation Safety Officers Newsletter, dated 1 October 1971.*

To obtain distribution of the U. S. ARMY AVIATION DIGEST and DA aviation safety posters, submit DA Form 12-4 in accordance with instructions on the form (see AR•310-2 and page 20 of this issue).

TALES FROM THE TROJAN

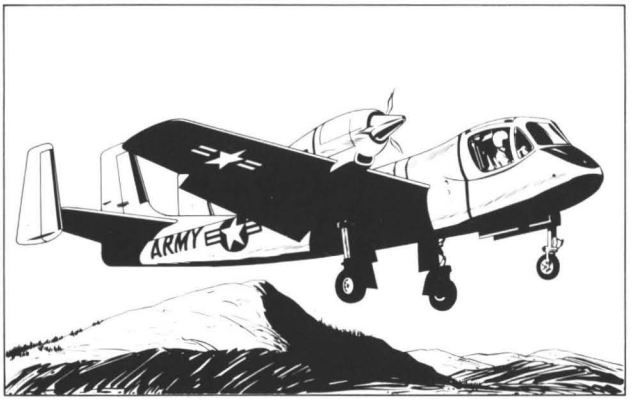
The following two stories were written by members of a recent Communications Skills class of COL Daniel M. Lewis (USAF, Ret.), Institute of Aerospace Safety and Management, University of Southern California



OBLIQUE SPIRAL

AS I STEPPED out of operations, I glanced up at the sky and saw the forecaster had been right about the haze. It was dense and yellow. I looked across the runway at a church steeple 3 miles away. I could just make out the shape and a few details, putting the field right at the visibility minimum for VFR.

I was starting out on an OV-1 photographic mission. My unit had been flying photo missions to cover all the bridge crossings and adjacent fording sites along a river for several days and my mission was to cover three bridges and adjacent



shorelines in a river valley. The entire misssion was within our local flying area and I filed a local 1080 for 1:30.

As I started toward the flight line, I dropped by the photo shop and told them I wanted a yellow filter on the camera to cut through the haze. I gave the Mohawk a thorough preflight and rechecked the camera system. The photo repairman had just finished putting in the filter and helped me make the functional camera test. Everything was working smoothly.

I started both engines, turned on the radios and called the tower for taxi clearance to the runup area. Five minutes later, I was cleared for a VFR departure and rolling down the runway. I lifted off at 80 knots, watched the air speed climb rapidly through 100 knots, pulled up the gear and flaps, then climbed at 140 knots. I had planned on 6,500 feet for my flight to the target area. That would keep me above most of the light VFR and helicopter traffic along the north-south corridors between three cities.

As I reached the target area, I rolled into a wide left turn and looked the area over. This stretch of the river ran through a deep valley, with the hills reaching 700 to 1,000 feet above the valley floor. The haze was thick, restricting visibility to 3 to 4 miles. For the scale I needed on the photos, I was going to have to make my passes at about 700 feet above the river. Concerned about other possible traffic along the river, I decided to go down and make a pass directly over the targets to take all the vertical shots first, then climb back to altitude and check for traffic before going back down to shoot the oblique shots individually. These would have to be taken while I was in a left turn.

I looked up and down the river and didn't see any helicopter traffic in either direction. I pulled the power levers back and rolled into a descending turn toward the river, leveling off at 700 feet and 200 knots. I pushed the power levers forward

to maintain 200 knots and checked my heading and alignment with the first target. It looked good and I flipped on the camera switch as I approached the first target. The camera pulse light flashed its steady rhythmical pulse, showing the camera was working.

I switched the camera off after the first target and started lining up on the second target. I looked across the river at the hills on the far side. The valley was a little over 3 miles wide at that point and I reasoned I would have no trouble turning when I started shooting the oblique photos. As I flipped the camera switch off after passing the third bridge, I pulled up into a climbing turn to take another look at the area before I started the oblique photos. I leveled off at 4,500 feet, checked the film footage remaining in the camera and pulled the camera sight up from its stowed position to the left hatch canopy. I set the camera sight to 30 degrees. I planned to use about 15 degrees of bank in my turns and this would give me the 45 degrees oblique photos I needed.

I checked for traffic again, lined up for the first target and started a descending left turn. I planned my descent so I would reach 700 feet and be in a left turn around the target with about 15 degrees of bank. I leveled off still turning and my position looked good. I readjusted the camera sight and, turning my head to my left shoulder, took a look. The sight was right on target and holding. I turned my head back into the cockpit and looked under my right arm to locate the camera switch on the rear of the center console. I found the switch and flipped it on with my right hand. As I turned my head back to the camera sight, I felt the aircraft rolling to the right and out of the turn I had established. I immediately moved the stick left to hold the turn. Looking to my left through the camera sight, I could not see my target. I reasoned that I had leveled too much and applied more left stick.

Suddenly, all I could see through the sight was river—straight down! I jerked my head away from the sight, realized I was rolling past 90 degrees of my bank and saw my air speed increasing to almost 300 knots. My heart sank. I was in a tight spiral, below 700 feet. By instinct, I wrenched the stick to the right to level the wings and started hauling back on it. I could see the ripples of small waves on the river and felt I was surely going into the water. My eyes started to blur. The "g" meter was showing 4 "g." All I could see down the tunnel my eyes were forming was water. Deciding I was too low to eject, I pulled back harder on the stick, hoping my wings were level. My vision dimmed almost into blackout, then I saw a pin hole of the sky. I relaxed some of the pressure on the stick and slowly saw more of the sky. I was climbing! I pushed the power levers forward and looked out at the river. It was barely 50 feet below. I was shaking all over and drenched in sweat.

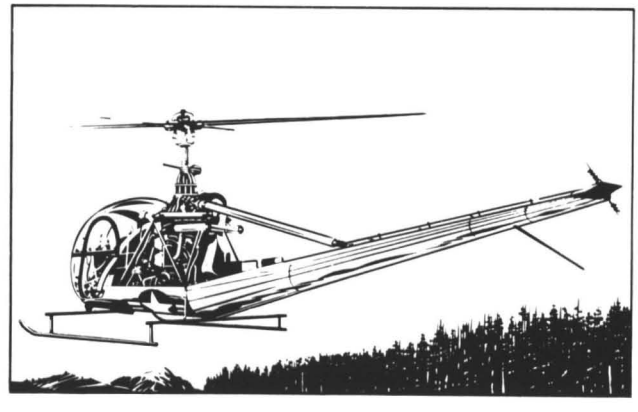
I leveled off at 9,500 feet and headed home. I decided I'd get the oblique photos later. Besides, I was out of film. I had left the camera running during the pullout from the spiral. Before trying again, I told myself, I would develop a procedure for turning the camera on without having to turn my head from looking left, to looking backward under my right arm!

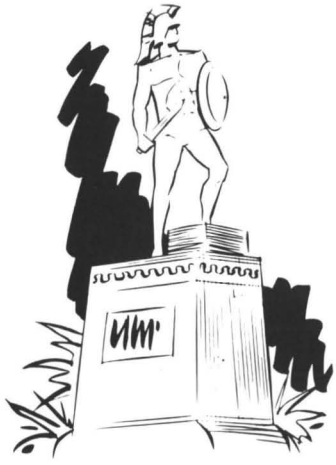
QUALIFIED?

AT 1415 HOURS on a fall day, an OH-23 crashed just west of a small southern town. A group of NCOs witnessed the crash and rushed to the scene to give first aid to the passenger who had fallen from the helicopter as it crashed through the trees. Someone tried to help the pilot, but was unable to remove him because the helicopter was inverted. The pilot's personal effects were removed and sent back to his unit *with the report of his death.* I was that pilot!

I graduated from flight school 7 months before the accident. Since that time I had flown about 40 hours in other type helicopters and 40 hours in OH-23s.

I was a member of a helicopter company where I had been assigned after graduation. A mission order came in requiring five OH-23 qualified pilots to go TDY for several months. They were to pick up five OH-23s and fly them to another post to support a vehicle transportation group. Four OH-23 qualified warrant officers volunteered immediately. I also volunteered, though I was not OH-23 qualified. Flying time was hard to come by in those days and I was young and eager. I also thought I could fly anything. Since no other pilots showed any interest in the mission, it was decided to give me a qualification ride around the traffic





TALES FROM THE TROJAN

pattern and make me the fifth pilot for the mission.

I was given a 1-hour ride in the traffic pattern at the local field and, early in the afternoon, we were issued our OH-23Bs. It was near dark when we left on the first leg of our flight. My first realization of lack of training came as I started my landing approach. It was pitch black and I didn't know where the landing light switch was. When I found the switch and turned on the light, I found myself less than 5 feet above the ground and descending. I managed to get it on the ground, but told no one for fear of having my ability questioned. After all, I did salvage the landing and I was sure I was beginning to get the feel of the OH-23.

The next day we flew on to our destination where we remained to become familiar with our new unit and its method of operation, mainly group headquarters support. It was here that we learned that we would soon be on our way to another state to participate in a field maneuver. Fifteen days after our arrival, we left for our field position. Twenty miles east of our first planned fuel stop, I had to make an emergency landing in a cotton field. The coupling joining the engine cooling fan with its drive shaft from the transmission failed and dropped into the fan. I gained my cool in time to recover from the autorotation I started at the first loud noise and landed with power. I was a little shook and rightly so. The fan blades almost severed the collective push-pull tube when they were knocked out of alignment by the failed coupling.

Three weeks after we arrived at our field position, I had accumulated approximately 40 hours in the OH-23 and thought that I could fly the box it came in. Little did I realize my inexperience was about to make me a statistic. A mission came into operations and it was my time up. Shortly after lunch, I left to pick up my passenger and take him on an area recon. I remember landing in a very small confined area, then woke up in a hospital the next afternoon.

Approximately 30 minutes after the accident, someone discovered that I was still alive. I was extracted from the wreckage and my passenger and I were evacuated to the hospital. It was there I regained consciousness the following afternoon, approximately 24 hours after the accident. I remembered nothing since landing the day before.

Witnesses reported the helicopter took off, reached an altitude just above the tall pines, appeared to stop, turned sideways to the right and the rotor blades struck the tops of the trees. The OH-23 started down through the trees, flipped upside down and came to rest on the mast, with the bubble in a depression in the ground. The passenger was thrown or fell out and sustained a dislocated hip and numerous lacerations.

I had started the flight with a full load of fuel and flown about 30 minutes before the accident. Needless to say, in an inverted OH-23, the pilot is going to get a good fuel bath. I smelled like gasoline for a week and realized that I was very lucky to be alive. It was a one-in-a-million chance that, as the helicopter hit the ground, the cockpit would come to rest over a hole in the ground. Had it been on level ground, I doubt if I would be here today because this was during the era before flight helmets. It was also a miracle the wreckage did not burn.

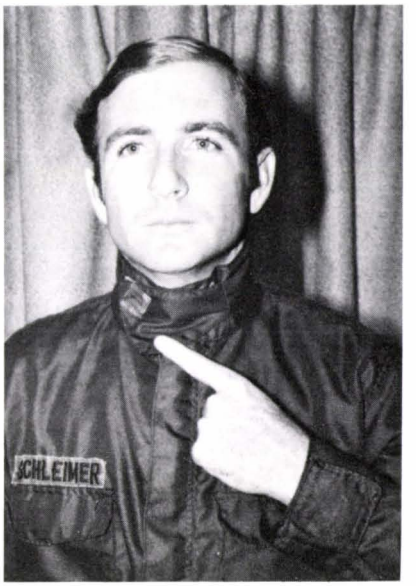
I was hospitalized for 3 months, then released and returned to flight status. During my stay in the hospital and since, I have wondered if it was truly as the accident board stated: "Pilot error for landing in an area of insufficient size and poor technique on takeoff."

Was I really qualified and experienced enough to handle that mission? Was the only cause of this accident pilot error, or was it a contributing cause? Was there another factor involved that today's aircraft accident investigation boards are more aware of? Could the real cause of this accident be called *supervisory* error?

PEARL'S personal equipment and rescue/survival lowdown

Dear Pearl:

In the past, the AVIATION DIGEST has published several articles and photographs stressing the proper wear of protective flight equipment. I believe these efforts have fostered a genuine concern by the individual aviator toward the proper wear of his personal equipment in such a manner as to provide him maximum protection. In regards to the Nomex flight suit, however, there is a protective neck tab which I feel has been overlooked as an item of protection. To date, I have never flown with another aviator who used this tab properly, and I constantly get strange looks when I use mine. Another distressing fact is that I have known aviators who



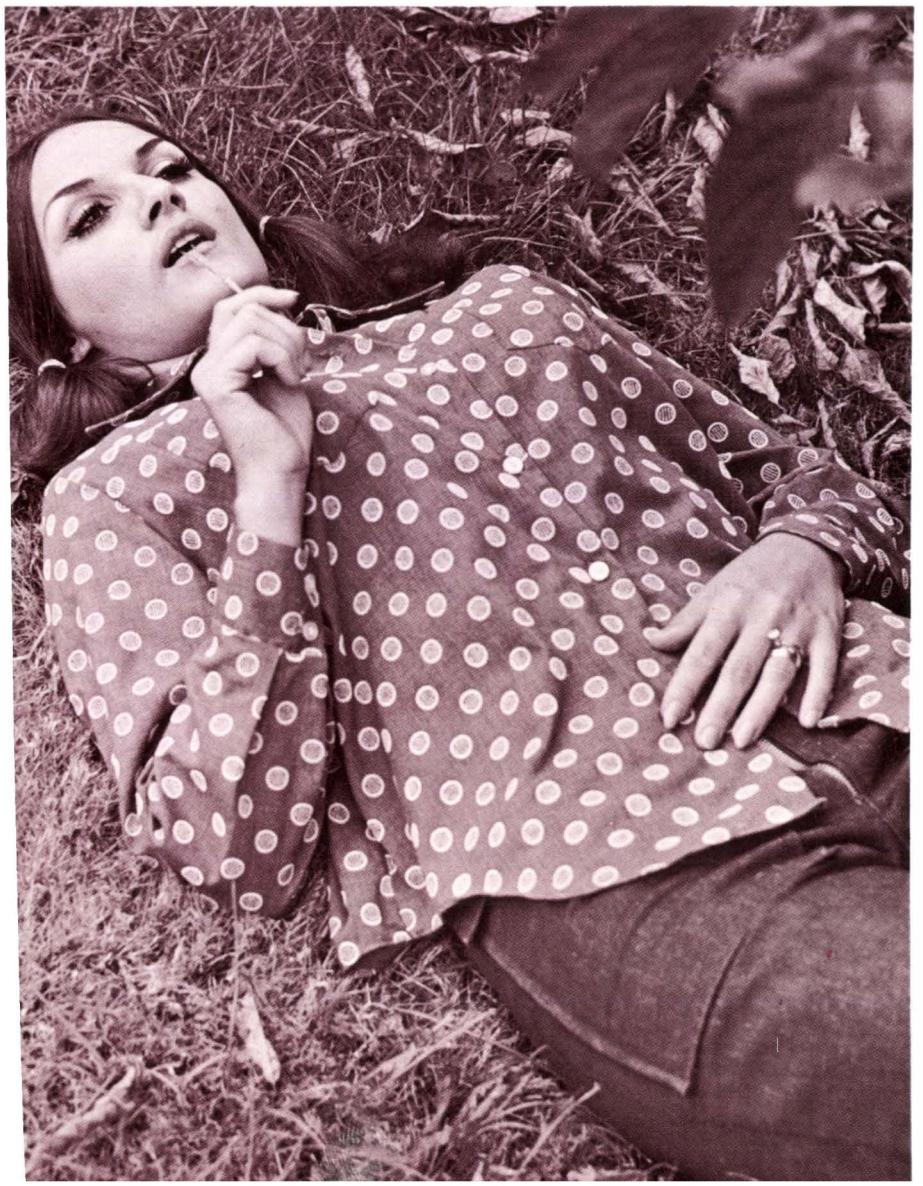
have cut this neck tab off so their collars would lie down neatly. I think everyone can readily see how beneficial this neck tab could be in case of fire. How about printing an up-to-date photo showing the neck tab being properly worn so that everyone can start getting the *maximum* protection available from their flight equipment.

CPT Lawrence T. Smith
Operations Officer
Advanced Instrument
Flight Division
Department of Advanced
Flight Training
USAAVNS
Ft. Rucker, AL 36360

Dear Captain Smith:

I certainly agree that no one should cut the neck tab from his Nomex flight suit. The accompanying picture shows how this neck tab should be used to afford maximum protection during emergencies or other hazardous situations. Thank you for bringing this to our attention.

Pearl



To be found guilty of gross negligence after 14 years of honorable service was a difficult cross to bear

Major Roy P. Hooks
Education and Prevention Department
USAAAVS

GUILTY! GUILTY! GUILTY!

MAJOR OVERSIGHT thought his head would explode from the resounding effect the verdict created as his mind retraced the events leading to his predicament. To be found guilty of gross negligence after 14 years of honorable service was a difficult cross to bear. He suddenly realized that his own occasional disregard for regulations and technical manuals had directly contributed to the tragic accident involving Lieutenant Hapless, the accident for which he now faced castigation.

It all began during Major Oversight's initial officer training. While he'd been given some instruction on the supply and use of official publications, there hadn't been much emphasis placed on the subject and the sense of importance was missing. It seemed only natural that he was apprehensive when he was assigned the additional duty of unit publications officer during his first tour. His uneasiness was allayed when Captain Dunderhead, his unit commander, told him: "Don't worry about it, Oversight. Publications are just guides and can't take the place of common sense anyway. Besides, they're hard to get and keep up with. If you need one we don't have, you can borrow it from battalion."

But Major Oversight recalled being embarrassed when the unit received an unsatisfactory rating for publications during an Adjutant General Inspection (AGI) that year. The inspector admonished him, saying, "You must establish an effective publications supply and utilization program! Publications provide all the information essential to the performance of official duties. DA publications are published by order of the Secretary of the Army in the name of the Chief of Staff and authenticated by the Adjutant General, as representing the acts, orders and directions of the Secretary of the Army."

Unfortunately, Major Oversight had been reassigned shortly after the AGI and did not become involved with management of publications supply and use programs again until he had assumed command of his company 6 months before his trial. But he recalled many intervening signals warning of the need to have, study and use official publications. Emphasis had been placed on the use of publications during flight training, on Army regulations in particular. The opening statement by the academics instructor had set the stage: "Army regulations are our most significant publications, since they contain missions, responsibilities, policies and administrative procedures necessary to ensure uniform compliance with those policies. While regulations are directive in

nature, they also serve as guides in many instances. The directive nature of instructions will be clearly indicated, if such is intended, by the use of imperative (do this) and future indicative (will) language."

Then came Vietnam, where many violations of regulations and operating procedures were clothed in the false fur of *"combat necessity."* There, Major Oversight fell victim to the *"to hell with it, this is war"* syndrome. This debilitating attitude accompanied him on his return to Fort Downfall where he assumed command of a unit filled with personnel with similar experiences. Most had recently returned from Vietnam and were still afflicted with the *"here's the way we do it in the real world"* attitude. It was only a matter of time, and Lieutenant Hapless just happened to be the victim.

The sharp rap of the gavel brought Major Oversight back to reality. "Do you have anything to say for yourself before I charge the jury to determine your sentence, Major Oversight?"

"Yes, your Honor. Yes, I do. When I entered my plea, I really felt I was innocent. I feel different now. It is eminently clear to me now that an effective publications supply and use program is essential to the orderly and effective accomplishment of assigned missions. I did not provide that for my unit. While I can't change the past, I can help chart the future. If given a chance to continue as commander, I will establish a model publications supply and use program.

"First, I'll appoint a unit publications officer. After briefing him on his duties and what I expect of him,I will require him to study AR 310-1, AR 310-2, DA Pam 310-10 and DA Pam 310-13. These publications govern general policies, supply, posting and filing of publications. Next, I'll have him prepare a publications SOP for the unit. This SOP will include requirements and procedures for quarterly inventories, semiannual reviews of the DA Form 12 series, posting and filing, review of the weekly bulletins from the publications supply centers, requisitions and use of publications. Once I have approved this SOP, the publications officer will present a class to all supervisory personnel on our publications supply and use program.

"We should then have an effective program. However, to ensure that it has a proper foundation, we will accomplish a comprehensive initial review. Each section will prepare a list of all publications it requires, using the DA Pam 310 series. One copy of the list will be kept on file in the section and one copy provided the publications officer. Each section will then inventory its publications. Those on hand, but not needed, will be turned in to the publications officer. Those which have been superseded will be destroyed. A list of current requirements will then be prepared. One copy will be kept on file and one copy provided the publications officer. Each section will then prepare a current copy of each DA Form 12 series applicable to its area. One copy will be kept on file and one provided the publications officer. The publications officer will consolidate all lists and forms and make the appropriate requisitions and submissions.

"Finally, I am personally going to assist the publications officer in establishing the proper use of publications within the unit. Each supervisor will maintain a supervisor's bookshelf which will include those publications which affect his day-to-day operations most closely. Each section will maintain a publications familiarization chart for all assigned personnel. Section commanders will personally supervise the review of new publications and changes to existing ones for any impact they may have on present operations, policies or procedures. All personnel will be made aware of the importance of and procedures for recommending necessary changes to publications. And all supervisors will include publications supply and use as a topic for initial briefings of newly assigned personnel.

"I know that what I have said represents a big change from my past attitude, but I now realize that if I had enforced the proper use of publications through example and supervision, there would have been a dash 10 checklist in that aircraft. Lieutenant Hapless would have used it and probably been alive today.

"That's all I have to say, your Honor. Thank you."

Instructions to the jury seemed to take forever. The shrill buzz of his alarm clock caused Major Oversight to sit up sharply. Boy, what a nightmare, he thought, reaching for his slippers.

FORT WOLTERS, TEXAS—CW3 Brian R. Arsenault, left, a check pilot assigned to the Army Primary Helicopter School's Flight Evaluation Branch, was presented the Army aviation Broken Wing Award by Brigadier General Leo E. Soucek, commandant. CW3 Arsenault was conducting a student evaluation ride in a TH-55A. On climb-out from the stagefield, with the student at the controls, the engine failed at approximately 100 feet and 50 knots. CW3 Arsenault immediately took control and entered autorotation, turning 20 degrees left to land in the only available open area, approximately the same dimensions as those of the helicopter. He landed with only incident damage.

Broken Wing Awards

FORT WOLTERS, TEXAS—CW2 Gary M. Butler, right, IP at Dempsey Army Heliport, was presented the Army aviation Broken Wing Award by Colonel James D. Bowen, assistant commandant of the Army Primary Helicopter School. CW2 Butler was on a TH-55A training mission at 1,000 feet over rocky and hilly terrain when the throttle seized. He was unable to maintain sufficient power to make a running landing and decided to autorotate. He flew to the heliport and autorotated, landing without damage. Analysis revealed that an accumulation of dirt and other residue caused binding in the throttle mechanism.

SAFETY IN COMBAT (continued from page 45)
required for all aviation supported operations. The strength of the commanders' response to this question indicates this interaction is not adequate. Army aircraft accident files contain much data supporting this opinion. This suggests that training for aviation supported operations would be properly included in ground commander career courses.

Conclusions:

(8) Aviators do not sufficiently understand the overall concept of aviation safety, making it difficult to teach them unit level safety and to police their compliance with each unit's particular safety requirements.

(9) The Army's safety program should be the subject of a course in flight school because units have enough trouble teaching and enforcing their particular safety requirements without being handicapped by aviators not having a basic understanding of aviation safety and their role in it.

(10) Commanders feel a solid background in aviation safety is a flight school responsibility and should not consume the monthly safety meetings, where pressing matters of unit safety require frequent informal exchanges of information.

(11) Commanders overwhelmingly (92%) agreed that ground commanders need further training in aviation operations, indicating the interaction between aviation and ground personnel is unsatisfactory and suggesting that aviation supported operations should be included as a topic in ground commander career courses.

Role of Aviation Safety Officers. In preceding sections, the role of unit commanders in aviation unit safety and training was explored. The purpose of this section is to investigate the role of unit ASOs by exploring how they are used, where they are needed and the command support they receive.

Question 12. "At unit level, the aviation safety officer should be an authorized TO&E position."

The purpose of question 12 was to determine current opinion about the use of ASO positions. In the past, many have subscribed to the theory that each aviator should be responsible for his safety and that of his colleagues. However, commanders (70%) clearly recognized the usefulness of ASOs by endorsing the idea of an authorized TO&E position. In spite of this strong support, 19% of the commanders disagreed, perhaps because of unsatisfactory experiences with ASOs. Or, this minority might still subscribe to the notion that, where safety is concerned, each aviator should be his brother's keeper. If this is the case, these commanders should review the discussion of question 2, where it is noted that accident files evidence inexperienced aviators taking even commanders' casual remarks as license to trade safe principles of flight for mission accomplishment. Not many experienced aviators want an inexperienced aviator as their keeper when their lives are on the line. It is the policy of most unit commanders to appoint ASOs, even though no regulatory requirement exists for their establishment as a TO&E position at or below company level.

Question 13. "The most qualified and experienced aviation safety personnel are found at battalion level or higher."

Question 14. "There is a need for well qualified and experienced aviation safety personnel at company level."

In response to question 13, 67% of all commanders indicated the most qualified and experienced ASOs were at battalion level or higher. Higher level commanders strengthened this by strongly agreeing (89.5% of those at brigade/battalion levels and 84.5% of those at company level). The opinions of higher level commanders might be more valid because they have worked at both lower and higher levels of command and are in a better position to compare the qualifications and experience of ASOs at both. Nevertheless, the majority of all commanders agreed that ASOs with the highest abilities were at upper command levels. This raises a crucial point about whether this distribution of ASO ability is best for aviation accident prevention purposes.

It must be asked whether the most highly skilled ASOs function most effectively as brigade/battalion level managers, or should they be used as specialists/technicians, sharing their knowledge and insight with aviators and commanders at company and platoon levels? Commanders, responding to question 14, yielded a partial answer to this question, with 91.5% agreeing (52% agreeing strongly) that a need for well qualified and experienced aviation safety personnel exists at company level. This opinion cannot be interpreted to mean that well qualified ASOs are not needed at higher command levels. But it does strongly indicate that more qualified ASOs are needed at lower levels of command.

Question 15. "A requirement exists for an NCO career field in aviation safety."

Responses to question 14 revealed more qualified aviation safety personnel are needed at lower command levels and question 15 investigated one

untapped source. Both commanders (63%) and ASOs (76%) agreed a requirement exists for an NCO aviation safety career field. The strongest agreement was evidenced for ASOs, perhaps because they more fully recognize, especially in larger units, that aviation safety is more than a one-man job and a trained aviation safety NCO is the logical source. The undecided group (25.5% platoon, 20.5% all commanders and 16.0% ASOs) may reflect the common practice of appointing aviators untrained in safety matters as ASOs. Undecided respondees may not understand basic principles of aviation safety or the trained work force required to successfully implement an effective accident prevention program. If so, the commanders' response to question 9 concerning the belief that aviation safety should be taught in flight school gains further support.

Question 16. "At battalion level, the aviation safety officer should work directly for the CO."

The power to get things done is commonly granted by close association. With this understanding, the purpose of question 16 was to determine the extent to which commanders recognize that ASOs require command emphasis to implement and enforce accident prevention programs. In response, commanders (83%) strongly agreed that ASOs should work directly for COs at battalion level. However, it should be noted that 31% of brigade/battalion commanders disagreed. Background information of those disagreeing revealed they were older than those who agreed, indicating their aviation careers started when strong enforcement of safety practices was the exception rather than the rule. This may explain their disagreement. Regardless, commanders strongly support having ASOs report directly to commanders. This further verifies the decided shift toward vigorous enforcement of accident prevention programs revealed by question 5.

The move toward enforcement of safety practices has occurred largely during the RVN conflict and the impetus is still not clear. Was it because the rapid aviation buildup required using inexperienced aviators who tended to disregard safety procedures and necessitated stronger enforcement? Or has the requirement for vigorous enforcement always existed, but has only been disclosed by combat in RVN? When the RVN war winds down, it will be revealing to see if enforcement also winds down.

Question 17. "Unit aviation safety officers receive adequate command backing."

By responses to question 16, commanders agreed that ASOs require command emphasis to implement and enforce safety programs. Question 17 asked whether the support given is adequate. Commanders (73%) and ASOs (60%) indicated adequate command backing. However, very few (15% commanders and 13% ASOs) *strongly* agreed. Coupled with those who disagreed (20% commanders and 30% ASOs), this is an indication that ASOs need more command support to successfully implement and enforce accident prevention programs.

Conclusions:

(12) Where aviation safety is concerned, each aviator cannot be his brother's keeper and the need for an authorized TO&E ASO position is clearly recognized.

(13-14) The most qualified and experienced ASOs are at battalion level or higher and more qualified ASOs are needed at lower command levels.

(15) An NCO career field in aviation safety is required because implementing aviation safety is difficult for one man, the ASO, and a trained NCO is the logical source of relief.

(16) Commanders (83%) strongly agreed that ASOs should work directly for their COs, further verifying the shift toward vigorous enforcement of aviation safety disclosed by the RVN conflict.

(17) Apparently, ASOs receive adequate command backing, but require more of the same to better implement and enforce accident prevention programs.

Aviator Proficiency and IP Instruction. Preceding sections dealt with safety personnel, practices and enforcement. This section investigates aviators' capacity for safety, i.e., requirements necessary for proficiency and requirements necessary for those who train aviators.

Question 18. "All aviators should be required to pass an OPEN book written examination at least once a year on the aircraft they habitually fly."

Question 19. "All aviators should be required to pass a CLOSED book written examination at least once a year on emergency procedures on the aircraft they habitually fly."

In response to question 18, commanders (94%) strongly agreed that all aviators should submit to an annual open book examination for the aircraft they habitually fly. Currently, aviators must only pass a general open book annual written examination on instrument flight procedures. A small but noticeable trend can be seen in differing degrees of agreement between brigade/battalion commanders (86%) and company/platoon commanders (95% and 96%). Perhaps the highly experienced aviator commanders at brigade/battalion level view open

book annual written examinations as: (a) more of a chore than a necessity; (b) only necessary in the general type (R/W or F/W) aircraft flown; or (c) less desirable than closed book examinations.

In response to question 19, commanders (88.5%) again strongly agreed examinations should be required. Commanders supported the need for all aviators to pass a closed book examination on emergency procedures for aircraft most frequently flown. The support (94%) for open book examinations was greater than that (88.5%) for closed book examinations. In both cases, however, commanders strongly supported requirements for annual written examinations covering the specific aircraft most frequently flown, whether they be open or closed book, or whether they involve standard or emergency procedures. These positive responses to added proficiency requirements lend weight to a major conclusion of preceding sections—a trend toward greater enforcement of safety requirements.

Question 20. "All aviators should be required to pass a check (standardization) ride at least once a year in the aircraft they habitually fly."

Presently, annual check rides are required only at the discretion of unit commanders. They are not required by DA regulation and the issue posed by question 20 is whether all aviators should be required to pass such annual check rides for specific aircraft they most frequently fly. Commanders (91.5%) overwhelmingly endorsed this requirement. In doing so, they indicated they are strongly in favor of both annual written examinations and check rides that will ensure a higher level of proficiency and safety for aviators. Supporting this as a valid requirement is the fact that the strongest approval came from company and platoon commanders, those closest to aviators in their operational environment.

Question 21. "Periodic tactical proficiency check rides are not worth the expenditure of manpower and equipment involved."

This question asked about the operational counterpart of standardization check rides—tactical proficiency check rides. Commanders (87.5%) responded that tactical proficiency check rides are worthwhile. This response, coupled with that to question 20, clearly indicates that both basic skill and mission oriented check rides are required to maintain combat readiness. This finding is supported by the practice in RVN of IPs observing aviators on operational missions (tactical checks); then, after mission completion, demonstrating necessary corrections and having aviators practice basic flight skills and emergency procedures (standardization checks).

Question 22. "During standardization flights and/or unit checkout flights, aviators should expect to practice or receive a demonstration of the emergency procedures most likely to occur in actual operations."

Question 23. "Even though the training may be more realistic, standardization and proficiency training conducted in aircraft at or near gross weight is taking unnecessary risk."

Question 24. "A proficiency check (standardization) ride should be flown when it is the only flight commitment the aviator has for that day."

Questions 22, 23 and 24 sought answers to issues about the content and conduct of check rides. As an indication of the thoroughness required in check rides, question 22 asked whether a demonstration of emergency procedures most likely to be needed should be expected. Commanders (98.5%) almost unanimously agreed, indicating the completeness of check rides should not be left to the discretion of IPs and that check rides need to be oriented to the operational environment. This finding further supports the necessity of combining standardization and tactical proficiency check rides, a common practice in RVN.

As a check on opinions of how far realism should go in proficiency training, question 23 addressed the issue of whether such training should be conducted in aircraft at or near maximum gross weights. Responses indicated commanders' opinions were polarized within each level of command. Overall, 39.5% agreed and 54% disagreed. This response was not surprising since any flight at or near maximum gross weight involves a higher risk. But, as noted, proficiency check rides in RVN are commonly combined with operational missions where aircraft may well be at or near maximum gross weight. However, commanders recognize the risks involved and normally require demonstrations and practice of standard and emergency procedures after mission completion. This may account for the polarization of responses to question 23. Nevertheless, for reasons which can only be conjectured, commanders are split in their opinions about whether to conduct proficiency check rides in aircraft at or near maximum gross weights.

The basic issue of question 24 was whether an aviator is up to a check ride after flying one or more missions the same day, or whether he is up to a mission if he flew a check ride the same day. Commanders' responses indicated the same polar-

ization (40% agreed and 52% disagreed) of opinions in answer to question 23, perhaps for the same basic reason—proficiency check rides in RVN are commonly combined with operational missions and the disagreement indicates commanders, for unknown reasons, are decidedly of two opinions about whether this is a sound and safe practice. Perhaps this practice was born of necessity, with commanders recognizing involved risks, but continuing the practice when operational commitments would not permit separate standardization and tactical proficiency check rides.

Question 25. "Instructor pilots should be limited to a maximum of 4 hours of instructional flight per day."

Question 26. "Instructor pilots should be required to take a 1-hour rest period between instructional flights."

In the same vein as question 24, questions 25 and 26 asked about the capabilities necessary for conducting instructional flights, this time asking about IPs instead of pilots. Responses to question 25 revealed commanders (64%) agreed IPs should be limited to a maximum of 4 hours instructional flight time daily. As level of command decreases, the degree of agreement increases (67.5% platoon and 55% brigade/battalion), indicating those closest to IPs on the flight line believe the length of instructional periods should be limited.

Responses to question 26 were divided (49% agreed, 17% undecided and 34% disagreed) about whether IPs should take an hour rest period between instructional flights. It is speculated that very few would disagree that IPs require some rest between flights and the ambiguous response to this question may reflect the ambiguity inherent in the question. The 1-hour rest period may have been too specific and many commanders may have reasoned this much time is not always needed and that the decision about how much rest is required after a particular flight should remain the judgment of IPs.

Question 27. "Instructor pilots should be limited to a set number of touchdown autorotations that they may perform or instruct in one day."

From 1 July 1969 through 30 June 1971, practice touchdown autorotations resulted in 412 mishaps with a damage cost of $4.7 million, attesting the importance of this question. Commanders' responses (57% disagreed, 18% undecided and 25% agreed) indicated, however, that IPs should not be limited to the number of touchdown autorotations they perform or instruct in one day. A separate query of aviators serving these commanders found they also preferred to leave this decision to IPs, but stipulated commanders must know the IPs' capabilities before granting this power of decision. Regardless, a recent safety of flight message recommends no more than six practice autorotations be performed during any 1-hour instructional period, and then only under carefully controlled conditions.

Conclusions:

(18, 19) Annual written examinations should cover standard and emergency procedures on the specific aircraft most frequently flown and may be open or closed book.

(20, 21, 22) Both basic skill (standardization) and mission oriented (tactical) check rides are required to maintain flight proficiency and should include demonstrations and practice of emergency procedures most likely to be used.

(23) Commanders recognize the risks involved in check rides at or near maximum gross weights and support the practice of standard and emergency procedures only after mission completion.

(24) The practice of combining check rides with operational missions was born of combat environment necessity and commanders are divided about whether this procedure is best or safe.

(25, 26) Instructional flight periods should be limited to 4 hours daily for each IP, but commanders are undecided about the length of rest periods required between flights.

(27) Commanders and their aviators agree that IPs should decide how many practice touchdown autorotations should be performed daily. A safety of flight message, however, recommends only six in any given hour under rigidly controlled conditions.

Risk Taking in Operational Environments. This section deals with survey questions focused on risks associated with mission accomplishment, including flight practices, maintenance, weather and instrument tickets.

Question 28. "Tactical urgency is used too frequently as a reason to ignore the sound principles of flight."

Question 29. "Individual aviators, more so than the unit commander, seem to be willing to accept unnecessary risks to complete a mission."

Question 30. Refueling (POL) areas may be used as troop staging areas during lift operations.

In urgent tactical situations, commanders try to assign crews with proficiency demanded by the situation. In response to question 28, however, commanders (60%) agreed that tactical situations are used too frequently as a reason to ignore sound principles of flight. Even in cases of tacti-

cal emergencies at night and/or in weather with the most proficient aviators available, these situations still do not excuse abandonment of sound principles of flight. The only way an aviator can get off the hook for mishaps in tactical emergencies is when he has been sent on a mission that is clearly beyond his capabilities (experience, training, physical or psychological state). Then his commander is solely responsible.

Responses of commanders (69.5%) and ASOs (69%) to question 29 agreed that the tendency of aviators to take unnecessary risks to accomplish missions is very real. This was not surprising, for one or more of the following reasons: (a) most combat aviators are recent flight school graduates, where it is required they develop and demonstrate a *can-do* attitude; (b) neither passing time nor experience gained has had a chance to temper this *can-do* attitude into one of trading off risks for gains; (c) young operational pilots fly "where the action is" (witnessing the results of their efforts on the safety of ground troops has a profound influence, motivating them to trade off personal safety to save their buddies); and (d) helicopter pilots are the last bastion of a "silk scarf" mystique that surrounded WWI aviators and perhaps take too many "Red Baron" risks as a result. Regardless, commanders must be alert to the risk-taking behavior of their aviators and take necessary steps to curtail taking needless risks. Specifically, during mission briefings with inexperienced aviators, commanders should emphasize the dangers and risks inherent in a mission, relative to the mission's importance.

Another issue of unnecessary risk taking is raised by question 30. During assault missions, commanders are tempted to save time by staging, unloading or reloading troops in POL areas, instead of performing these operations in nearby areas. This practice is dangerous because of the large number of troops milling around (perhaps smoking) in areas with large quantities of fuel and many aircraft maneuvering into position for refueling. An inordinate number of accidents have occurred under these circumstances and commanders (70.5% disagreed) generally did not support this practice. However, 62% of brigade/battalion commanders agreed that the use of POL areas for troop staging is an acceptable practice, while company (84%) and platoon (84.5%) commanders overwhelmingly disagreed. It is suspected this major disagreement is due partially to the type of POL areas these commanders are familiar with. Refueling (POL) areas at brigade/battalion level are usually airfields where adequate room exists for troops to be clear of the actual refueling area. However, company/platoon commanders deal more with confined unimproved POL areas (often in unsecure territory) where the presence of milling troops is a decided hazard. Nevertheless, too many accidents have occurred with troops in POL areas and commanders, recognizing the inherent dangers, disapprove of the practice.

Question 31. "Aircraft involved in precautionary landings should remain at their location (the hostility of the environment appropriately considered) until proper maintenance authorities have been consulted to determine the feasibility of further flight."

Question 32. "Aviators who decline aircraft that are overdue for an intermediate inspection or some comparable maintenance deficiency are in the minority."

Questions 31 and 32 sought information on aviators' willingness to take risks where aircraft maintenance is concerned. To obtain such an indication, the subjects of these questions involve two principles of aircraft safety that are frequently violated. In response to question 31, commanders (92%) overwhelmingly agreed the decision to continue flight following a precautionary landing should be made by the aircraft commander *only* if necessitated by circumstances in a hostile environment or after consultation with proper maintenance authorities. The strength of this response was somewhat surprising since, in practice, aviators who discover the cause of relatively minor aircraft difficulties after a precautionary landing often either fix it themselves, without calling in, or fly the aircraft back with the malfunction still present. The commanders' response is more understandable when it is considered that most of the aviators under their command are young and inexperienced. This is especially true for commanders who have witnessed the disastrous consequences of incorrect diagnoses.

The overall response to question 32 indicated commanders (61.5%) and ASOs (71.5%) believed most aviators decline aircraft overdue for intermediate inspections or comparable maintenance deficiencies. It should be noted, however, that 62% of brigade/battalion commanders take the opposite view. Perhaps these commanders felt maintenance deficient aircraft are accepted because so many accident reports they read cite known maintenance/materiel deficiencies as cause factors. (Mishap files support this, especially the high number of forced landings.) Regardless, re-

sponses to this question indicated the practice of accepting maintenance deficient aircraft is widespread enough to account for the large number of accidents and forced landings caused by known maintenance/materiel malfunctions. This deserves concentrated attention from commanders and maintenance personnel.

Question 33. "Present regulations which permit zero/zero takeoffs should be changed to require that takeoff weather conditions be equal to the landing minima for the departure field."

Question 34. "Special instrument certificate holders should be required to comply with the minima required of standard instrument holders."

Questions 33 and 34 required responses to the same basic issue—whether regulations should be changed to disallow takeoff below published field minimums. Less than 10% of Army aviators have special instrument tickets permitting zero/zero takeoffs. Commanders (43.5% agreed, 17.5% undecided and 39% disagreed) and ASOs (55.5% agreed, 18% undecided and 23% disagreed) were basically divided within each level of command about whether this practice should be disallowed. Reasons for this polarization of opinion within each command level perhaps result from two schools of thought: (a) combat commanders recognize tactical emergencies sometimes require takeoffs below minimums, but they also know that such takeoffs are dangerous and should be performed only when absolutely necessary; and (b) visibility minimums had their origin in F/W aircraft and R/W aircraft require lower minimums. Most of the commanders surveyed were in charge of R/W aircraft and this might explain the negative responses.

Presently, a *special* instrument ticket holder can clear himself for IFR flight and can take off below field minimums, but a *standard* instrument ticket holder cannot. In response to question 34, commanders (46% agreed, 18% undecided and 36% disagreed) were basically divided overall and within each level of command about whether special ticket holders should be required to comply with minimum takeoff visibilities imposed on standard ticket holders. Responses to questions 33 and 34 were strikingly similar.

Question 35. "Release of an aircraft for flight into marginal weather conditions should be the responsibility of some higher authority than the aviator assigned to the flight."

Question 36. "Flights into weather below 1,000 feet and 3 miles visibility should be cleared by the aviation unit commander or his designee."

Question 37. "Flights into weather below 500 feet and ¼-mile visibility should be cleared by the aviation unit commander or his designee."

In response to question 35, commanders were essentially divided (54% disagreed and 41% agreed) on whether clearance into marginal weather conditions should be the responsibility of some higher authority than the aviator. Commanders (47.5% agreed, 10% undecided and 42.5% disagreed) were again divided in their responses to question 36, about whether flights into weather below 1,000 feet and 3 miles (VFR takeoff minimums) should be cleared by aviators or unit commander/designees. However, in response to question 37, commanders (67.5% agreed and 25.5% disagreed) indorsed the idea that flights into weather below 500 feet and one-fourth mile (IFR takeoff minimums) should be cleared by unit commanders or their designees.

Basic findings concerning the issue of more weather restrictions or not were: (a) no regulation change regarding special and standard instrument tickets is necessary; (b) flights into marginal (1,000 feet and 3-mile visibility to 500 feet and ¼-mile visibility) weather can be the responsibility of instrument certified aviators; but (c) flights into weather below 500 feet and ¼-mile visibility (IFR conditions) should be cleared by aviation unit commanders or their designees. These findings indicate commanders are hesitant to delegate unqualified weather clearance authority, even to well qualified aviators, in an operational/combat environment. This reluctance is well founded because accident files evidence a large number of accidents where aviators overestimated their ability to fly operational missions in marginal or deteriorated weather conditions.

Question 38. "The award of the tactical instrument ticket should require demonstration of satisfactory instrument takeoff proficiency."

Question 39. "Instead of tactical tickets, helicopter pilots should be awarded standard instrument certificates or none at all."

Questions 33 through 37 revealed commanders are hesitant to delegate weather clearance authority even to qualified aviators and questions 38 and 39 asked what degree of instrument qualification is required for combat aviators. In answer to question 38, commanders were again divided (54.5% agreed and 36% disagreed), this time on whether tactical ticket holders should demonstrate satisfactory instrument takeoff proficiency. The fundamental issue was, given that tactical tickets are to be awarded, whether or not aviators should be required to demonstrate a level of instrument proficiency enabling them to safely handle inad-

vertent IFR conditions. Commanders at brigade/battalion (67%) and company (49%) level disagreed, but platoon commanders (68%) agreed, revealing two sides to this issue. Perhaps platoon commanders reasoned that aviators, especially tactical ticket holders, need all the instrument proficiency they can get, whereas brigade/battalion and company commanders reasoned that tactical ticket holders should never be assigned missions where they will require instrument takeoff proficiency. Regardless of the logic, these two points of view lead to the topic of question 39.

The rotary wing class of aviators scheduled to graduate on 30 November 1971 will be awarded standard instrument tickets, making the tactical vs standard instrument controversy a moot issue. Supporting this decision, commanders responding to question 39 agreed (74.5%) that rotary wing aviators should be awarded standard instrument tickets or none at all.

Though the tactical ticket only required approximately 8 hours less than the standard ticket, the tactical ticket program quickly drew charges of, "Instilling too much confidence into inexperienced aviators," and, "Tends to make commanders expect too much from tactical ticket holders." These charges were founded on a considerable number of accidents, but were based on the wrong line of reasoning. Commanders did indeed expect too much instrument proficiency from these aviators, but it was because the instrument ticket holders these commanders knew from the past had a great deal of aviation knowledge and experience, *in addition to* instrument tickets. They were not fresh out of flight school. Secondly, the tactical ticket program did instill false confidence in aviators, but only because tactical ticket holders were equated with highly experienced ticket holders of the past. In sum, instrument proficiency of tactical ticket holders has not been on a par with standard ticket holders of the past, not because the program was faulty, but because of inexperience.

Many still believe instrument flight training remains too fixed wing oriented in instruments and procedures to satisfy the needs of rotary wing aviators. For example, with current instrumentation F/W instrument takeoffs (ITOs) require one bar width *above* the artifical horizon, whereas R/W ITOs require one bar width *below*. Further, F/W and R/W environments are significantly different (e.g., F/W instrument procedures are used mainly at night and/or in weather, but R/W aviators are frequently forced to rely on instruments because the horizon is lost in dust, trees, mountains, and buildings, in addition to darkness and weather). Nevertheless, the standard ticket program is underway and will bear careful scrutiny to determine its success.

Conclusions:

(28) Urgent tactical situations are too frequently used to excuse risk taking beyond sound principles of flight.

(29) The tendency of aviators, especially inexperienced aviators, to take unnecessary risks for mission accomplishment is very real.

(30) Staging of troops in *confined* refueling (POL) areas is an extremely dangerous practice, no matter how much time is saved.

(31) The decision to continue flight after a precautionary landing should be made by the aviator *only* if necessitated by a hostile environment or after consulting proper maintenance authorities.

(32) The practice of accepting maintenance-deficient aircraft is widespread enough to account for the large number of accidents/forced landings caused by maintenance/materiel malfunctions.

(33, 34, 35, 36, 37) No change in regulations regarding clearance requirements of special and standard instrument tickets is required. Flights into marginal (1,000 feet and 3-mile visibility to 500 feet and ¼-mile visibility) weather can be the responsibility of instrument certified aviators, but flights into weather below 500 feet and ¼-mile minimums should be cleared by unit commanders or their designees.

(38, 39) Commanders feel that aviators need all the instrument proficiency they can acquire, but would rather have aviators awarded standard tickets or none at all.

Use of Accident Prevention Information. The first three questions of this section asked how widely safety publications are distributed, how much they are read and whether their orientation encourages readership. A fourth question inquired about a regulation to specifically delineate the duties of pilots and copilots for all Army aircraft.

Question 40. "Safety publications are found in almost any office on most posts, but often are quite scarce on the flight line."

Question 41. "The safety publications that do reach the flight line are seldom read."

Question 42. "Too few safety publications are directed toward the individual aviator."

In answer to question 40, commanders (55.5%) and ASOs (71.5%) agreed safety publications are frequently found in offices, but are scarce on flight lines. This agreement is by no means unani-

mous, with considerable disagreement at company (46.5%) and platoon (36.5%) levels. Regardless, safety publications should be available on the flight line because aviators spend considerable time there before and between flights, affording ample time to remain current on aviation safety matters that concern them.

Even if the distribution of safety publications were optimal, are those that reach the flight line used? In answer to question 41, commanders and ASOs were basically divided. This response indicated many safety publications reaching the flight line are seldom read and, in addition to the problem of distribution, there is concern about how aviators can be motivated to read them.

Interest can be generated more easily when readers are able to identify with or relate to a publication's content. Question 42 postulated that few safety publications are directed toward individual aviators. The response of commanders (61.5%) and ASOs (54%) was mild agreement, indicating safety publications might get wider use if oriented more toward aviators.

Question 43. "DA should publish a document which specifically delineates the duties of pilots and copilots for appropriate Army aircraft during all phases of operation, under both instrument and visual flight rules."

Question 43 posed the question of whether a need exists for a document to delineate duties of pilots and copilots to aid flight standardization. Failure to delineate these duties has been evident in many UH-1 accidents and accident boards have recommended standardization of these duties to improve crew coordination. However, commanders (48% agreed and 35.5% disagreed) provided only marginal support for this idea. This divided support may have resulted from a belief that unit SOPs developed for this purpose are satisfactory or because some commanders were not aware of the problem. Nevertheless, the problem does exist and an acceptable solution must be found.

Conclusions:

(40, 41, 42) Safety publications require better flight line distribution and require more orientation to aviators to improve the frequency with which they are used.

(43) Accident reports reveal many UH-1 mishaps due to poor crew coordination, but commanders gave only marginal support for documentary standardization of pilot and copilot duties in appropriate aircraft.

Flight Evaluation Boards Based on Accident Reports. As stated, the results of previous sections have evidenced support of a trend toward increased enforcement in Army aviation safety. This section reveals commanders' opinions on one possible method of implementing such enforcement.

Question 44. "USABAAR [now USAAAVS] should be granted the authority to request, on the basis of information provided in accident investigation reports, that aviators who have caused more than one aircraft accident appear before a Flying Evaluation Board."

Question 45. "If USAAAVS, on the basis stated in the previous question, had the authority to request that aviators appear before flying evaluation boards, it would tend to prejudice the report findings of investigators."

Question 44 asked whether USAAAVS should have authority to request flying evaluation boards, based on accident reports, for aviators who have caused more than one accident. Commanders were divided (39% agreed and 48.5% disagreed) about whether USAAAVS should have such a role. Disagreement progressed with levels of command (41.5% platoon, 63% company and 67% brigade/battalion). Since the results of previous sections have conclusively shown commanders endorse more aviation safety enforcement, the reason for the divided opinions evidenced in question 44 may hinge on (a) use of USAAAVS versus unit commanders as the agent of safety enforcement; (b) the real value of requiring flying evaluation boards for aviators revealed in accident reports to have caused more than one accident; and/or (c) the possible prejudicial influence of mandatory flying evaluation boards on those who prepare accident reports.

In connection with question 44, the prejudicial influence of mandatory flying evaluation boards was anticipated and question 45 asked commanders whether they thought such an effect would result if USAAAVS could request aviators to appear before flying evaluation boards. The commanders expressed agreement (54.5%) that accident reports would reflect such a prejudice. It is evident that any one or a combination of the three reasons discussed in the previous paragraph could be the basis on which commanders yielded a divided response to the question of USAAAVS assuming an enforcement role in aviation safety.

Conclusion:

(44, 45) Commanders were divided about whether USAAAVS should be authorized to request flying evaluation boards, based on accident report findings, for aviators causing more than one accident, and on whether such board actions would tend to prejudice accident report findings.

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

Radar advisory service

Smaller cockpit library

Radar Advisory Service—Attention All Pilots: USAASO Sez has pitched most of its past comments to air traffic controllers, but that's not to say we're not aware of your problems.

One area of interest to all of us, particularly for pilots, is *MIDAIR COLLISIONS!* Right now we don't have a firm fix to this problem but we're working on it, and we do have a current suggestion that just could save your life.

Flying into highly congested terminal areas can occasionally red line pucker factors but not necessarily for the aviator who knows the score. The Federal Aviation Administration has initiated a program requiring all radar approach control facilities to provide *VFR traffic* radar advisory service. But *you must request the service!* These services include—

- Issuing wind and runway information.
- Issuing *traffic* information on a workload permitting basis.
- Specifying time or place at which the aircraft is to contact the control tower for landing information.
- Providing radar vectoring service.

Our suggestion is simply that every pilot take advantage of every service that is made available to him in high density terminal areas. Use that radar advisory service!

Another suggestion is to practice this procedure by requesting radar advisory service at Army airfields where radar is available. This is not a common practice today, but if you pilots put enough pressure on the local Army ATC facility it could become a requirement in the near future.

VFR-Supplement/Aerodrome Sketches-U.S.: Good news for you overburdened DOD FLIP carriers! To spare you pilots further curvature of the spine by lugging numerous reference manuals on each flight, and to lighten your load, USAASO has proposed a new publication to the triservice aviation community to take the place of the present VFR-Supplement—U.S. A prototype has been compiled for a new VFR-Supplement/Aerodrome Sketches—U.S. and is well on its way to publication. The general idea is to cut down the "cockpit library," the number of volumes you pilots have to tote around in your flight kits. The new VFR-Supplement will consolidate the present one and the Aerodrome Sketches—U.S. *into one volume.* A few wrinkles have to be ironed out, such as: type of binder, format, required information, sketch position, special requirements, etc.; however, USAASO is in the fifteenth round and still punching to get these items resolved. The new DOD FLIP should leave the launching ramp and be airborne sometime in March 1972. USAASO will be eagerly looking forward to your comments and suggestions for further improvements to this FLIP. This is your flight publication; let's hear from you throttle pushers and other users!

RUCKER GETS

Low Pressure Altitude Chamber

THE FIRST CLASS

ONE OF THE CONTROL PANELS

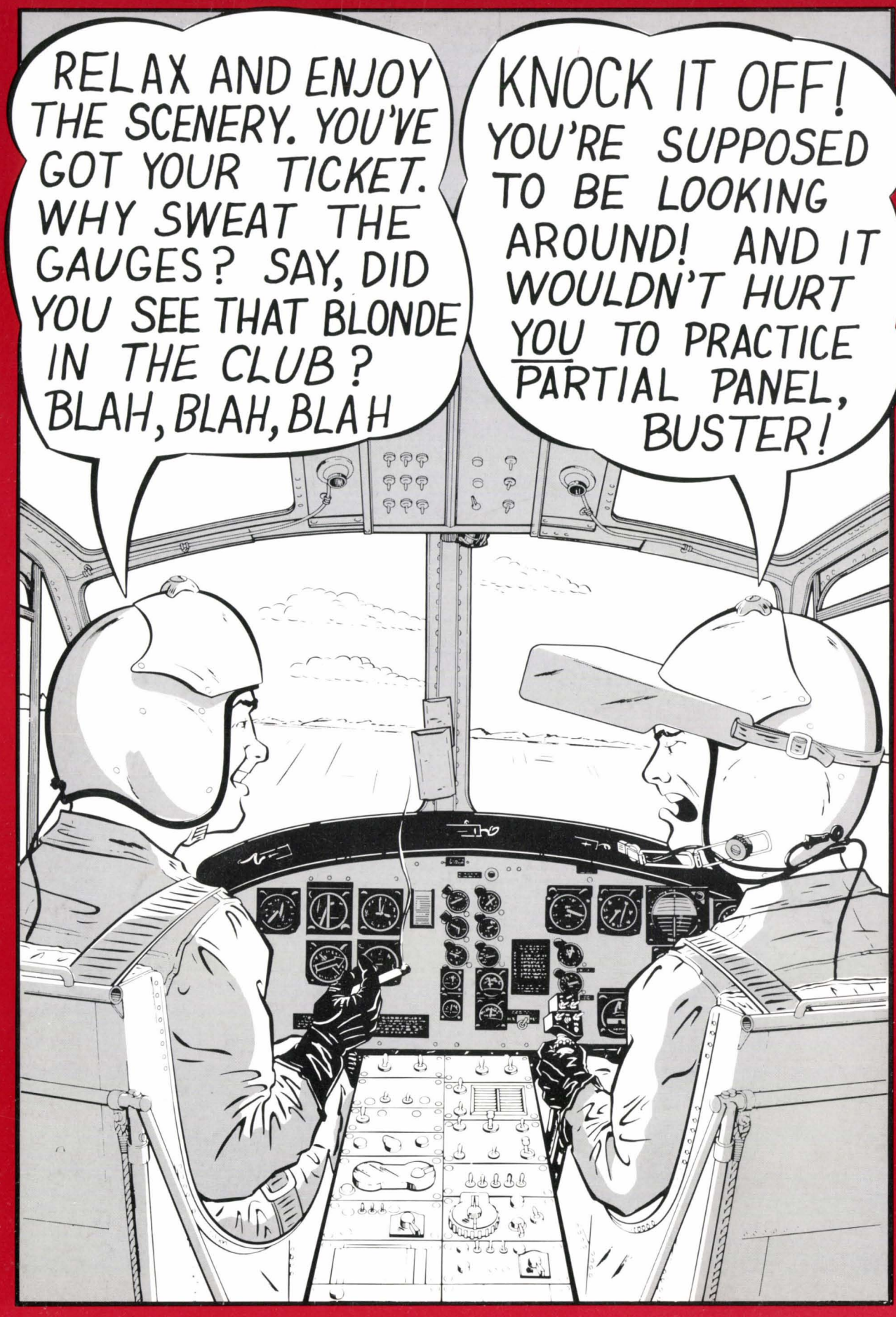
THE FIRST LOW pressure altitude chamber for training purposes in the Army has been installed at the U. S. Army Aviation School, Ft. Rucker, AL. It is capable of simulating ascents to 100,000 feet, but for training purposes will not be used to demonstrate flight over 43,000 feet.

The chamber will be used by the school's Department of Aeromedical Education and Training to demonstrate effects of hypoxia and decompression problems and also the effects of trapped gasses including ear and sinus blocks resulting from barometric pressure changes. It will allow students to practice oxygen equipment utilization and emergency procedures as well as to practice various denitrogenation and rapid decompression procedures.

All officer and warrant officer candidate students will participate in a chamber flight to 25,000 feet to demonstrate the signs and symptoms of hypoxia and the effects of changing barometric pressure on the body.

Fixed wing students will receive specialized training in the altitude capability, mission requirement and oxygen systems of aircraft they will fly. U-21F pilots will receive rapid decompression training and U. S. Air Force and Navy students will receive training to altitudes consistent with their needs.

In addition to training, the chamber will also be used for operational research and medical inflight evaluations.


RELAX AND ENJOY THE SCENERY. YOU'VE GOT YOUR TICKET. WHY SWEAT THE GAUGES? SAY, DID YOU SEE THAT BLONDE IN THE CLUB? BLAH, BLAH, BLAH
KNOCK IT OFF! YOU'RE SUPPOSED TO BE LOOKING AROUND! AND IT WOULDN'T HURT YOU TO PRACTICE PARTIAL PANEL, BUSTER!