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UNITED STATES ARMY
APRIL 1970

AVIATION DIGEST

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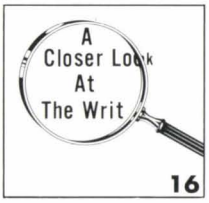

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ABOUT THE COVER

Inside the embattled ARVN compound at Hue in the Republic of Vietnam the wounded are hurriedly loaded aboard Warrant Officer Fred Ferguson's UH-1. For his actions WO Ferguson was awarded the Medal of Honor. See "Stay Clear of Hue" on page 12.

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.

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

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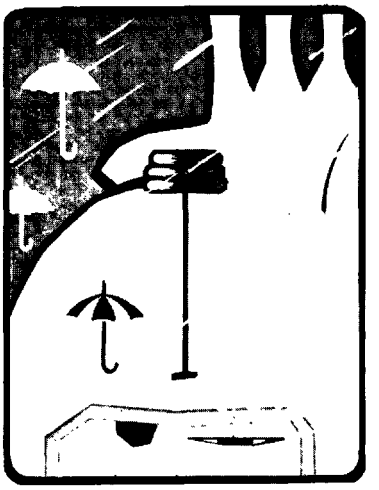
VIEWS FROM READERS



Sir:

The pilot of a U-21 aircraft ramped his aircraft downwind at our airfield in a moment of haste and did not secure the propellers. Consequently, the props were turning through in a reversed direction at approximately 30 to 40 rpm as a result of the 25-knot winds which occurred during his absence.

I am under the impression that when the engine of a turbine is shut off and no oil pressure is reaching the three main bearings to the N1 impeller shaft, it may cause serious damage to these bearings if the propeller is allowed to spin or freewheel in the wind.

Will you please send me an answer to this question as it has created a great deal of controversy. . . .

W01 J. J. Howell
52nd Aviation Detachment
APO San Francisco 96259

• The Department of Maintenance Training (DOMT), U. S. Army Aviation School, Ft. Rucker, Ala., researched this problem for us and replied to the effect that paragraph 3-75, TM 55-1510-209-10/1, dated March 1969, advises the pilot to tie down the propellers to prevent windmilling with zero oil pressure if *strong* winds are anticipated while the aircraft is unattended. In the absence of specific criteria to define *strong* or *high* winds, local military weather personnel were of the opinion that steady winds of 20 to 25 knots could be considered strong.

It was the consensus of opinion of DOMT and contractor maintenance personnel that slow windmilling of the props will not cause damage. However, due to the requirement of a one hour cooling period before installation of the standard prop tiedown device (which cover the exhaust ports and secures the prop), some other device should be used to secure the props if the aircraft is to be left unattended prior to the end of the cooldown period.

Sir:

For several years now you have regaled (?) us with the derring-do of that intrepid airman, Horatio Frozzleforth. You have carefully catalogued his lack of judgment, dangerous habits, disregard for his passengers' welfare and safety and his complete disdain for Army regulations. With such a complete file assembled, why has one of his many commanding officers not taken action to eliminate him not only from the aviation program but also from the Army? Perhaps a friend in USABAAR is covering for him.

We have all known "Frozzleforths" in our tenure of service but happily they didn't last long. Several eliminated themselves while others hung on for various board proceedings to do the job for them. Only your fictional hero has managed to continue his destructive path up the promotion trail without encountering a commanding officer who believes in utilizing the Manual of Courts-Martial to augment his aviation safety program.

It appears that we long-suffering readers will be stuck with the tales of Colonel Frozzleforth or even General Frozzleforth when his time in grade comes up. No doubt this will be followed by "Son of Frozzleforth," etc.

Please save us from a fate worse than missed minimums! Kill off Frozzleforth once and for all in a spectacular crash that involves *all* the pilot error crash causes for the past 12 months. I would be most happy to furnish the funeral detail.

LTC Paul L. Stansel
U. S. Army Infantry Center
Ft. Benning, Ga. 31905

• Well, colonel, one out of 21,000 aviators isn't a bad percentage—and if we killed off old Froz we'd lose a good teaching point. But, "Son of Frozzleforth"—truthfully we hadn't yet thought of that.

Sir:

I am submitting the attached article for consideration and publication in the DIGEST with the hope that it will inform aviators being assigned to USARV of the efforts being made to put the "P" in personnel.

We are constantly seeking new methods for improving our replacement processing. The preference sheet mentioned in the article, as well as the phone call to our field grade officers and senior warrant officers, are recent additions to our processing procedures and have received favorable comments from our aviators.

LTC George E. Derrick is currently the chief of the Aviator Assignment Branch. LTC Derrick was with both the Aviation Warrant Officer Branch and Armor Branch at DA. MAJ Robert B. Treat Jr. is the aviator company grade and warrant officer assignments officer working with LTC Derrick. I was formerly the chief of the Aviator Assignment Branch until moving to my present job. Hope you can use the article.

LTC Billy E. Rutherford
Chief, Off Repl Div
HQ, USARV
APO San Francisco 96375

• LTC Rutherford's article "Assignment: Vietnam" appears on page 26 of this issue.

Sir:

I am writing this letter in hope that I might enlist the help of your publication. The 12th Aviation Group (Combat) has been in Vietnam since 18 June 1965.

It has come to our attention that there has never been a history written of the 12th Aviation Group.

We have very little to go on in the way of documents and there are no

Continued on page 15

THE SOLDIER-AVIATOR

Brigadier General Sidney B. Berry
Assistant Commandant, U. S. Army Infantry School

Aviation and ground tactics in today's Army are not separate functions but rather a combination which form an unbeatable team. By the same token, the aviator, as a vital part of this team, is more than a mere technician with the sole mission of mastering his aircraft. He is a flying soldier who is always a soldier first and an aviator second. His responsibilites and goals are the same as those of the man on the ground

NOTICE THAT "Army aviator" is a two word term. This means that Army aviators are *soldier-aviators*. First they are soldiers, members of the United States Army, and they have the same mission to serve their country and society that every soldier of our Army has.

But a closer look reveals that Army aviators are more than just plain soldiers. They are soldiers with special aviation skills and capabilities which they put at the service of all other soldiers in our Army.

Unfortunately there are a few pilots flying Army aircraft who look primarily and sometimes exclusively at their role as *aviators*. These pilots are technicians—technicians without a sense of understanding—technicians really without heart and soul. They focus on technical proficiency and how to fly.

However, almost all Army aviators want to be—and are—far more than technicians. They relate their particular skills and capabilities to the whole Army. These Army aviators—or these soldier-aviators—have a sense of mission and purpose that makes them an

The Soldier-Aviator

integral part of the entire United States Army and all of its traditions and service to our country. To me this is the meaning of the term Army aviator.

Let me tell you how ground combat soldiers feel about soldier-aviators. We look upon them as being soldiers with skills and capabilities that are not just *useful* to the Army, but *absolutely essential.*

Let's put it in the context of combat in the Republic of Vietnam. The ground combat soldier is flown into battle aboard the assault helicopter. Indeed, before he is flown into battle it is the Army aviator—flying light observation aircraft—who scouts out the targets, finds the enemy, defines the objective and assists in placing the fire support on the objective. This makes it more possible and more feasible for the ground soldiers to make an airmobile assault with minimum casualties to themselves and the soldier-aviators.

Usually when the ground combat soldier is landed by airmobile assault, he immediately becomes entirely dependent upon the soldier-aviator for every bit of his support. The Army aviator resupplies the infantryman with food, water and the ammunition needed to engage the enemy. Whenever he runs into an enemy position that he cannot handle with his own organic weapons, the infantryman calls on other soldiers for help. They may be artillery-soldiers or aviator-soldiers, but they are other soldiers.

When a ground combat soldier is wounded, he knows full well that a soldier-aviator will come with a medical evacuation helicopter to fly him out of the hell he is in to the finest medical care in the world.

And when the battle is won, the ground combat soldier is flown out of the battlefield by the soldier-aviator, or perhaps to another battlefield that has just developed because other soldier-aviators have found new targets.

Army aviators are the really new element in military operations in this century. How does a non-flying soldier look at the flying soldier? With deep respect, with admiration, with affection, yes, and with an utter and complete sense of dependence upon that soldier-aviator. It is reassuring to know that whatever mission soldier-aviators are asked to perform, they will do simply as a matter of course, no matter how great the obstacles or difficulties. And the most remarkable thing is that the ground soldier comes to accept these exploits merely as being commonplace. This is probably the ground soldier's highest tribute to the flying soldier.

How do soldier-aviators look at those soldiers on the ground? I don't speak first-hand on this; but I speak from observing, talking with, flying with, living with and fighting beside many flying soldiers. I'm repeating their views, but I think that this is an accurate report.

The soldier-aviator views the ground soldier with almost exactly the same mixture of attitudes and emotions that the ground soldier views the flying soldier: respect, admiration, affection. This mutual feeling is something that develops in the heart. It is more an emotion than a thought or mental process. It is quite important that the soldier-aviator comes to feel a strong sense of responsibility for and obligation to the soldier on the ground. He knows the strong dependence, the utter reliance, that the ground soldier has on the flying soldier. And the flying soldier lives up to these high expectations of the ground soldier.

This sense of responsibility and obligation causes the soldier-aviator flying the gunship, the slick or the medevac chopper to brave the thickest of fire so someone on the ground can have the chance to live. This is one soldier risking his life for that of another soldier—and you can bet that he will.

The United States Army—as in no other military force in the world today—has blended ground and aviation operations into a unity of ground warfare. Army aviation is an integral, organic part of ground operations. Our Army does not separate aviation and ground functions. We do not separate flying soldiers and ground soldiers. We view the flying soldier and the ground soldier as an inseparable, unbeatable team joined in a single effort.

But this is only a beginning. Our Army has yet a long way to go in achieving the maximum operational and combat effectiveness of its air-ground team. The Army aviators who don their wings today join with their flying and ground soldier contemporaries in working toward an Army aviation-ground team that is more tightly knit, more imaginative and more effective than ever before. This is an absolutely essential part of the Army's future.

Don't Let This Opportunity Slip Through Your Fingers.

READ...

POTPOURRI

SEVEN NEW AND revised field manuals have recently been completed for publication by the Doctrine Directorate of the Combat Developments Command (CDC), Ft. Belvoir, Va. Distribution will be made through the Adjutant General channels as each becomes available.

The publication of a revision to FM 1-15, Aviation Battalion, Group and Brigade will update and consolidate material previously contained in the April 1967 edition of FM 1-15 and the April 1968 edition of FM 1-20, Nondivisional Combat Aviation Battalion, Group and Brigade. This revision deletes all applicatory material from the manual, deletes or reduces duplicated material, updates titles of aviation units and adds air traffic and airspace control elements to conform to current doctrine.

Nomex No-No

Gunners in some helicopter units are cleaning weapons while wearing their Nomex flight suits, a flight surgeon reports. As a result the flight suit becomes saturated with grease and cleaning solvent solution. Of course, this does nothing to help its fire protection qualities.

Several 'Nam returnees have mentioned that in some units crewmen are permitted to wear the Nomex shirt outside the trousers. This practice could lead to possible inadvertent separation of the two pieces at a critical moment, resulting in far more serious burns.

ATC School At Rucker

The first three classes to be trained in the newly located Air Traffic Controller School at Ft. Rucker, Ala., were graduated 3 February 1970. Prior to October 1969 all Army air traffic controllers were trained at Keesler Air Force Base, Biloxi, Miss.

Last February, 12 students were graduated from the Air Traffic Controller Tower Operator Course and three from the Ground Control Approach (GCA) Course. Four students were graduated from the Approach Control (AC) Course in March.

All students in the three courses study the same common subjects for the first seven weeks and then receive their FAA basic controller certification. Next, they are separated to study their own specialities. The Control Tower Operator Course lasts 13 weeks, the GCA Course 14 weeks and the AC Course 16. Subjects studied include weather, FAA regulations, navigation, communications, flight assistance services, enroute training and airports.

While the school was located at Keesler AFB, both Army and Air Force equipment were used in training. This necessitated some retraining of students who use only Army equipment in the field and had not had an opportunity to become familiar with it. However, this problem has been eliminated since training at Ft. Rucker involves Army equipment only.

Home At Last

Sergeant Major Cyril G. Manning's departure from the Republic of Vietnam last January was a well thought out move. In fact, it took him eight years of Vietnam duty to decide to come home. The way he put it, "I wanted to make sure that when I went back to the States, I'd stay there permanently."

SGM Manning started out as the Army Assistant Aviation Advisor to the Vietnamese Armed Forces Field Command in 1962 and afterward joined the 1st Aviation Brigade as one of its first enlisted men.

In 1965 he was selected by the Army Aviation Association of America as the Aviation Soldier of the Year and traveled from Vietnam to Washington, D. C., to receive his award.

We hope that SMG Manning finds his new "hardship" tour in the States a comfortable one and we wish him a hearty "welcome home" for a job well done.

FM Revised

The revised FM 6-102, Field Artillery Battalion, Aerial Field Artillery, is a guide for aerial artillery commanders and supported commanders and includes doctrine, organization and employment of aerial artillery. This revision will add doctrinal guidance pertaining to the fires of nonorganic armed helicopters and will implement usage of the term "aerial field artillery (AFA)" to replace the term "aerial artillery."

Supercool and Company

Supercool, a veteran combat pilot, breaks in a new crew and learns the hard way what it means to achieve teamwork. Will Hotstuff, the green new guy, get up in time to preflight the aircraft? Will Itchy, the crew chief, make sure the fuel cap is secured? Will Trigger, the new door gunner, remember to wear his flight gloves? Read on and find out

CW2 Joseph M. Wilson

IT WAS ABOUT 2200 hours and everyone was sitting around discussing the humorous things that had happened on their missions that day. Someone had set up a $700 stereo in his tent so there was music. About this time Lieutenant Smith walked in with the next day's missions. Supercool checked things over quickly and saw that he had the artillery mission with Hotstuff as copilot and Itchy and Trigger as crew chief and gunner.

Hotstuff is new and so is Trigger, Supercool thought, but the artillery mission is simple so there shouldn't be any problems. Let's see, takeoff is 0630, so if I get up at 0545 that'll give me time to eat and walk to the aircraft with about 15 minutes to crank and take off. Hotstuff will preflight and report the ship up at 0530. With these closing thoughts Supercool went to bed to get the good night's sleep that flight surgeons urge.

Supercool was straight—he didn't drink, got plenty of sleep and always ate a hearty breakfast before a flight. He remembered the things he was told in flight school about accidents that were caused by slow reflexes from drinking and/or not eating breakfast.

The next thing that entered Supercool's world was his alarm clock. It was 0530 and it usually took him about 15 minutes to wake up and get dressed. By 0545 he had shaved and dressed and was on the way to the mess hall with that ton of extra equipment that was necessary for flying in the Republic of Vietnam. About halfway to the mess hall, Captain Jones stopped him, "Why isn't your ship called up?"

"What do you mean?"

"Well, it hasn't been called up. You'd better get out there and preflight that thing; battalion is already on the phone."

"But . . . well, I thought. . . ." Supercool rolled his eyes and thought, Boy, that Hotstuff! You can't take your eyes off these new pilots 10 minutes and already they start to goof up. I'll bet he's still racked out.

Supercool went into Stuff's tent and sure enough . . . zzzzzzzzzzzz.

"Hey! Get up! You were supposed to have been out and preflighted the ship by now."

Hotstuff sat up, "Oh, I'm flying with you today? What time are we supposed to take off?"

Supercool was speechless. Well, what could he say? "We take off at 0630 and hurry—we're flying Colonel Campbell and he's a stickler on times."

"Sure thing," Hotstuff replied. As a new pilot he hadn't been told about the one hour mission ready times. But he knew now.

By the time Hotstuff was fully awake Supercool was beating feet to the aircraft. He quickly deposited his gear in the cockpit and began his preflight. After about 15 minutes he cranked the ship, hurried an electrical check and turned on the radios.

"War Bum 877, this is War Bum control, over."

"This is 877, we're up and mission ready at this time."

"Roger, this is War Bum control. Be sure to report to ops after your mission today, over."

"Ah . . . roger." Supercool looked at his watch and it was 0615—not bad time considering, but there went the good breakfast. He decided he'd let the UH-1 idle because by the time he let the engine cool and started it again he would be late for his mission. While he was waiting for his pilot Supercool glanced back at his crew. What greeted him was enough to scare any good aircraft commander. There sat Trigger—no gloves, sleeves rolled up, helmet unsnapped, vigorously flexing his trigger finger.

"Trigger, where are your gloves?"

"What gloves?"

"The gloves you're supposed to wear when you fly. Itchy, go straighten him out."

"Yes sir."

By this time Itchy was already coming through the cargo compartment yelling at Trigger loud enough that he didn't need to use the intercom.

It was 0630 now and there was no copilot in sight.

Boy, Colonel Campbell is going to ream me out if I'm not there on time. Where is Hotstuff anyway Supercool frantically thought. "I guess I had best call control and see if they can find him."

"War Bum control, this is War Bum 877, over."

"This is control. Go ahead."

"Ah . . . roger, have you seen my copilot around there?"

"Roger, he just walked through the door. He's trying to find out what ship he is supposed to fly. We'll send him down. Also, be advised you are late for your takeoff time."

"Roger."

From the way things had started it sure looked like it was going to be a long day. Supercool saw his copilot approaching and also noticed that the gunner was about squared away. Things weren't too bad if they were only 10 minutes late taking off. Maybe the colonel would drink an extra cup of coffee today.

After takeoff, Hotstuff contacted the colonel's dispatcher to tell him they were inbound and would arrive at 0700, right on time (at 110 knots). Things weren't going quite so bad, but he had missed breakfast.

Old Cool was just beginning to think that things weren't as grim as he had imagined when he was interrupted by a blast from Hotstuff.

"Say, Supercool, do you want to refuel?"

"What?"

"Well, we only have 150 pounds of fuel and I thought that was a little low for this mission."

After this exchange, Supercool wasn't sure what to do. If he stopped and refueled he would be late, but if he ran out of fuel he would be even later. Not much choice.

With this thought racing through his mind, Supercool shot an approach into the refueling area with one of those nifty sideways flares that always stopped a Huey on a dime—and once in a while on small trees, telephone poles or unsuspecting POL men.

While the crew chief was trying to teach the gunner how to refuel an aircraft, Supercool was starting to sweat. Well, not much can be done now he thought, so I might as well make the best of things. The crew chief and gunner hopped into the ship and called "both sides up." They knew they were late so they were rushing things too.

Ten very long minutes later they touched down at the hotspot at 0715. The colonel was a little anxious, to say the least.

"Let's go, I have an appointment with the general at 0745."

Supercool expedited things as much as possible with a Vietnam takeoff that helped take some of the excess color out of the colonel's face. But again luck was with Supercool and by holding 110 knots he made it on time.

At destination, the colonel gave him instructions to return to the hotspot and fly a resupply mission, but to return at 1045 sharp.

"O.K., take the ship and return to the hotspot," Supercool directed his copilot, "while I check with flight following and artillery."

With this, Hotshot took the controls and executed a takeoff similar to the one Supercool had made. This took all of the color out of Supercool's face.

"What do you think you're doing—you trying to kill us all?" The intercom wasn't needed for Stuff to hear Cool's remark, although it was used. This confused Stuff because he thought this was the type takeoff that all the old hands used. Oh well, after I gain a little more experience I guess I can make those takeoffs, Stuff thought.

The rest of the day was fairly uneventful except for the time when Supercool started to take off with the colonel half in and half out of the aircraft; or when they had to delay a mission because the fuel cap hadn't been replaced when they refueled; plus the time a C-130 appeared mysteriously out the right window. Funny how the radomes on the front of those things can look so big.

Come to think of it, it was a rather hectic day for Supercool, but it was his fault. He was responsible for the team effort that didn't materialize.

When more than one person tries to accomplish a goal, a team becomes involved. No one is so good that he can complete a mission by himself. This refers to any mission—flying, working or anything. Since we are concerned with aviation, let's examine how teamwork is involved in every phase of aviation, especially inside the aircraft.

Teamwork has to start from the moment a mission is assigned. The aircraft commander must check with the entire crew and brief each one on the mission and what he expects of them. This is especially important anytime there is a new crew member. It also is important that the members of the crew constantly cross-check each other to ensure that all are doing their jobs properly. Anytime one team member fails in his job, the other members have to pick up his portion. It was Supercool's responsibility to ensure these points. As it happened, he lucked out—he could have missed more than just his breakfast.

Maintenance

. . . WHEN PAINTING ROTOR BLADES

Painted Vibrations: A requirement initiated in 1969 asked that rotor blades be painted contrasting colors of black and white to enable better overhead spotting. This painting caused untold man-hours in not only painting but most of all in working out vibrations (usually lateral types). These vibrations were caused by uneven painting and varying densities of black and white paints. To avoid this problem the following procedures should be incorporated into this color conversion:

- Ensure that both blades are thoroughly cleaned and wiped down with an appropriate solvent.
- Weigh out even amounts of black and white paints. Usually the densities of black and white paints, even of the same brand, will vary. Use the same brands.
- A consistent procedure should be used when applying the paint. It is a good idea to have the same man do all the painting.
- After the paint has dried, lightly sand both blades with a very fine grain. This will ensure a smooth consistent airflow over the rotor blades.

The application of these procedures ensures a minimum of man-hours in the conversion. It should be noted however that even with this carefulness a close check should be made to determine if vibrations have developed since it is very difficult to apply this paint evenly. Until factory produced matching black and white blades are in the inventory we will have to be continually aware of the lateral vibration related to "home-made" paint jobs.

Note: After flying the newly painted blades for several hours wearing of paint will be seen. This wearing will cause lateral vibrations if wearing is uneven. This may require repainting and sanding. A check should be made every several hours of flying for paint wear.

★ ★ ★

O-Ring Installation: Be extra careful when installing the packing—performed (O-Ring), P/N MS29561-146, FSN 5330-067-9994, in the engine oil filter, to include tightening of bolt, P/N SP806, FSN 5306-446-6481. Incorrect installation of these components can cause serious engine oil problems. Remember, do not reuse an O-Ring or one that has been damaged or installed incorrectly and taken out again.

★ ★ ★

OV-1 Oxygen Exhaust: "Do not disconnect oxygen lines to regulator unless it is certain that the cylinders have no pressure. If the pressure is not known, exhaust the system by placing the oxygen supply switch to ON and the diluter demand switch at 100 percent oxygen." Reference TM 55-1510-204-20 chapter 11, section IV, pages 130, 132 and 133.

Matters...

Caution: With the switches set as described above the oxygen system pressure will not be exhausted. With the diluter demand switch in the 100 percent oxygen position, oxygen will be delivered to the user upon demand only. With the supply switch in the ON position and the emergency pressure control lever in the "Emergency" position the system pressure will be depleted. The same caution should be applied to the U-21 aircraft since the oxygen systems are equipped with the same pressure demand regulator.

★ ★ ★

U-21 Emergency Static Air Source: The emergency static air source on the U-21 is controlled by a round knob on the upper right corner of the instrument panel. This system provides an alternate source of static air for certain flight instruments in the event of blockage in the normal static system. To activate the emergency system, the knob is rotated in a counterclockwise direction. TM 55-1510-209-10, paragraph 3-16, dated March 1969, and the pilot's checklist both read "Emergency Static Air Source—OFF." Pilots are turning the knob clockwise to ensure this OFF position. After a number of pilots have performed this check, the knob could be too tight to be rotated to the ON position in the event of normal system failure. The emergency system would then not be available for use.

There are two ways to correct this situation. One is to change the TM and pilot's checklist to read as follows: Emergency static air source—check for freedom of rotation and then OFF.

The other method is to designate an OFF position on the panel behind the knob and mark the knob with an arrow. The knob could be drilled and a tab located on the panel to accommodate a safety wire. The knob could then be safetied in the OFF position with breakaway wire. A visual check of the knob and wire would then ensure the OFF position. This system will prevent the possibility of the handle being tightened to the OFF position and assure positive operation when needed.

★ ★ ★

Check The Ring: When performing a preflight inspection and postflight inspection on your UH-1C and AH-1G helicopters inspect the safety on the Friction Collect Assembly "Ring" (P/N 540-011-488-3, FSN 5340-947-6258) for security; also the bootdust and moisture seal that encloses your friction collet (P/N 204-010-453-1, FSN 1615-615-3398).

If there is an indication that the boot is being twisted—check the safety on the ring since it could mean the safety has been broken, thereby causing the ring to back off.

This has been noted to happen frequently on both the UH-1C and AH-1G HueyCobra.

★ ★ ★

CH-54 Hydraulic Pressure Line: In the Republic of Vietnam considerable problems occurred with the rigid hydraulic starter pressure line breaking on the CH-54. It was found that by replacing the rigid type line with a flexible line considerably less trouble was encountered. If the flex line did fail, it would require only about 15 minutes to replace as compared to approximately four hours for the rigid line.

★ ★ ★

CH-47 Corrosion: Some CH-47 units have experienced corrosion of the structure beneath the flooring of the CH-47 caused by the accumulation of water and other materials being trapped in the water-tight compartments beneath the flooring. In extreme cases this can also seriously affect the aircraft's center of gravity. Opening the fuselage drains during extended periods of aircraft down time to allow water to drain and air to circulate through the compartments will aid in correcting this problem.

NIGHT VERTIGO

Captain Terry P. Gardner

AS AN ASSAULT helicopter company, the 116th was primarily engaged in combat operations in support of the 25th Infantry Division based at Cu Chi, Republic of Vietnam. The slicks (Hornets) and the guns (Stingers) provided support ranging from combat assaults to the usual routine (ash and trash) missions.

We had become well versed in the aspects and techniques of a combat assault and, along with the ground units of the Tropic Lightning Division, had developed into a coordinated team that could work extremely well together in any situation. Due to this fact, both the 25th and the 116th had a high regard for each other and often it was this mutual respect that caused the two to give just that little extra or to "hang it out" a little further to help the other guy.

Such was the case late one evening in August. With the monsoon season well at hand, we were aware of the torrential rains and high winds that can literally pop up out of nowhere. It had been an easy day. Eagle flights just north of Saigon had experienced absolutely no contact. The ground troops of the 2nd Brigade had conducted reconnaissance in force missions but failed to turn up any action.

Being close to release time, the battalion commander decided to insert his unit in a landing zone (LZ) just north of a village complex where it would secure for the night. As pilot of a UH-1C in fire team lead I brought the slicks in and completed the lift. All that was left now was to cap the LZ sweep and to cover a few slick loads of resupply.

Typically, after an especially boring day, the ground troops began to take light sniper fire from the south. It was release time for us but we weren't about to go home. As we reconned ahead, one of our ships took heavy fire that subsequently forced him down in a secure area. After assuring his safety we returned to the area of contact to find the VC. With the ground commander's help we pinpointed Charlie's location and made some firing passes.

At this point C&C (command and control) elected to send us to Cu Chi as we were low on fuel and ammunition and could provide little cover. It was almost completely black in the area of operations (AO) and we had seen ominous thunderstorms building up to the north earlier in the day. Nevertheless, we elected to stay on station to cover the last slick resupply and to cap just a little longer for the infantry.

As we were approaching the 20-minute fuel warning light, we monitored that the slick load was delayed and C&C ordered us to return to Cu Chi for fuel. Enroute back the slick completed his resupply with no fire and it seemed things were quiet in the AO. C&C then released us from the mission.

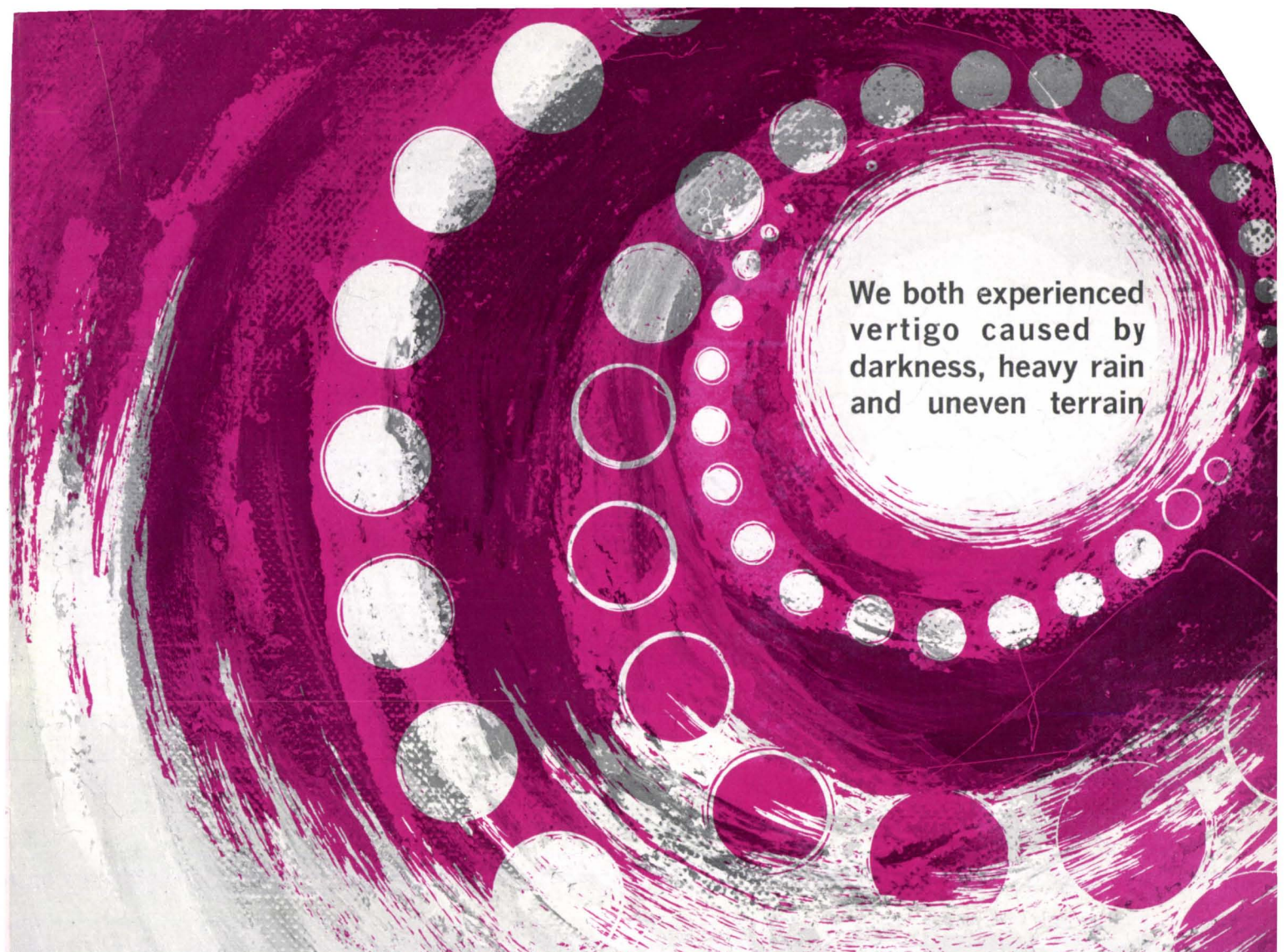
About five miles out of Cu Chi we hit some steady rain and good strong gusts of wind. It was difficult to see the base camp but we continued flying. We advised C&C of the situation and he replied that he would be enroute in a few minutes.

Nearing Cu Chi we received weather reports from the tower and were advised of low ceilings, extremely heavy rains and poor visibility. On the downwind leg, the rain seemed like a solid sheet of water, and we could hardly make out the refueling area. But, we didn't care. All we could think of was some hot chow, a shower and a cold beer. Besides, we were well into our 20-minute light and had nowhere else to go.

As we turned base it seemed like all of the South China Sea was being dumped directly on our aircraft, and I had to fly instruments to maintain attitude and altitude. At about 200 feet we could more or less see our destination and on final we managed to avoid perimeter wires, bunkers, poles and Chinooks that lined the approach path. Now we had it made. An approach to the ground was made with no problem.

Now that we were in the refueling area it seemed a simple matter to pick the aircraft up to a hover, do a left pedal turn and move to a refueling point. This is where our problems began. Number one, the rain was stronger; number two, there was no visible horizon; and number three, the only light available was from our search and landing lights.

As I picked the aircraft up everything seemed to be in order. But after completion of the pedal



turn the main fuel line directly in front of us (painted white) seemed to be moving up and down. Suddenly the left end of the pipe seemed to rise in the air as the right end went down. Then the opposite happened, only at a much faster rate. Things seemed to be spinning around in a kaleidoscope of white lights, red lights, instruments and rain, rain, rain. Luckily, I immediately realized what was wrong and took the only action possible—I yelled at the aircraft commander that he had it. He took control and attempted to hover forward. At this point I felt the aircraft begin to roll left and right on its longitudinal axis, and I again felt that queasy feeling of disorientation sweep over me. However, I rather sloppily plopped the Huey on the ground and decided enough was enough. That cold beer would just have to wait.

It should be obvious that we both experienced (although fortunately not simultaneously) pilot vertigo (spatial disorientation) caused by torrential rain illuminated under the close-in brilliancy of an electric landing light over uneven terrain. Also, we both were tired and complacent.

The cases of vertigo were mild in one sense. We both realized what was wrong, we knew what to do about it and we both recovered quickly. Still, it was the first time either of us had gotten pilot vertigo, even though we both had over 800 hours in the UH-1.

Thinking it over, we realize that we never should have flown so far into our fuel limit, especially with the known weather conditions. Further, the approach to the base camp should never have been attempted and, with the existing weather, hovering should not have even been considered.

When the rain stopped four cautious and weary crew members returned safely to the "nest" for that cold beer.

It was neither skill nor experience that saved us from a costly accident. Luck was on our side that night and got us out of a situation no aviator should ever get himself into.

Desire to accomplish the mission and to do more than necessary is an admirable quality, but when it endangers life and equipment the purpose is defeated.

STAY CLEAR OF HUE!

The warning was to stay clear of Hue because the enemy was mounting heavy assaults on the city and inflicting extensive damage and numerous casualties. Warrant Officer Fred Ferguson knew his wounded comrades needed to be evacuated immediately. He ignored the warning and flew his UH-1 into Hue. The decision resulted in the rescue of several critically wounded men—and the Medal of Honor for WO Ferguson

Lieutenant Colonel Wilfred A. Jackson

THE NIGHT OF 30 January 1968 had been long and nerve racking because the LZ had been under continuous rocket and mortar attack since before midnight. Consequently, as dawn broke over the Hue area of the Republic of Vietnam that Wednesday, the helicopter crews of C Company 227th Aviation Battalion (AH), 1st Cavalry Division (Airmobile) were uneasy. To make matters worse, missions for the day were delayed due to low overcast conditions extending north to the DMZ.

By 0930 hours the clouds had moved to the north clearing Hue and word was received for C Company to take off and head for Camp Evans to support the Cav's 3rd Infantry Brigade. The 227th's commander elected to accompany C Company to Camp Evans while the remainder of the battalion was to move north to rejoin the rest of the division.

At 1000 hours, the battalion commander took off and turned north. He was flying with the commander of C Company, the battalion sergeant major and four passengers. As they passed over the city of Hue their UH-1 received intense 12.7 mm machine-gun fire. The ship took numerous hits and was forced to land in the city below.

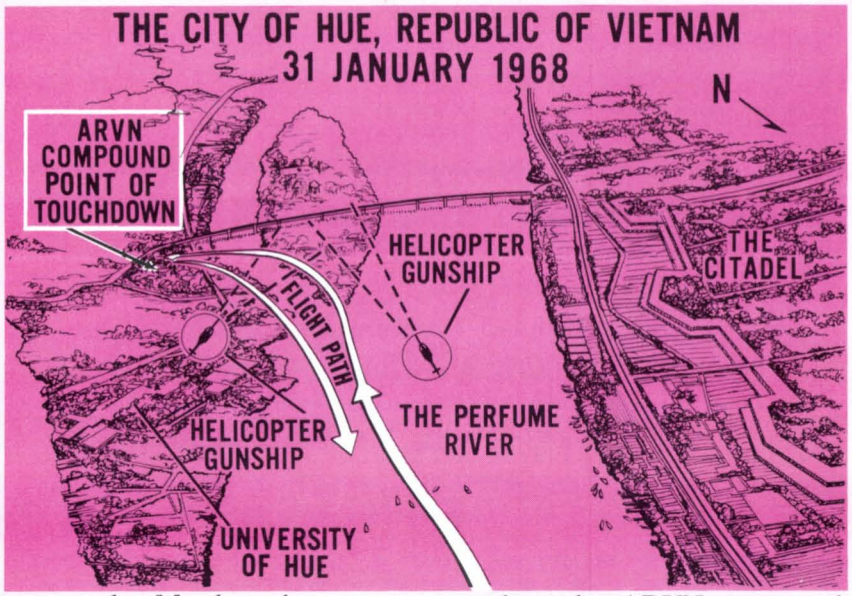
Seconds after touchdown, the helicopter was raked with small arms fire and a round from an RPG (rocket propelled grenade), fired at point blank range, crashed through the right windshield and detonated against the pilot's seat. The aircraft lay smoking in a rice paddy, a scant 100 yards from an ARVN (Army Republic of Vietnam) compound. Fire was being received from every direction. The ship had landed amid an NVA (North Vietnamese Army) battalion which had surrounded and was attacking the South Vietnamese engineer company in the compound.

The C Company commander, gunner and crew chief moved to the edge of the rice paddy and determined that the compound was still in friendly hands and would offer sanctuary for the wounded crew and passengers. The 227th commander, who had been wounded and blown clear of the Huey by the exploding RPG, laid down a base of fire which covered the withdrawal of the passengers into the compound. He then followed them inside the protective walls of the compound to relative safety. Contact with the outside world, more particularly the aircraft of the 227th, was established using radio equipment of the ARVN engineers.

The word had been received. Two helicopters had monitored the Mayday call and tried to respond by following the stricken ship to the ground. But they were driven off by intense fire from heavy and light automatic weapons.

Following the initial attempt to

Streaking from the embattled compound, WO Ferguson's Huey came under even heavier enemy fire than it encountered on the way in. Time and again the aircraft was rocked as it took hits, but WO Ferguson made it to safety with his wounded passengers



answer the Mayday, three more aircraft made a try at flying through the withering hail of fire to reach the isolated bastion and retrieve the wounded crew and passengers.

The radio transmissions were frequent concerning the fate of the men on the ground and those making the unsuccessful attempts to retrieve them. These calls were closely monitored by aircraft crews and ground control stations alike.

The order was finally put out for all to hear: *Stay clear of Hue!*

During this action Warrant Officer Fred Ferguson was flying a logistical mission nearby and had been monitoring the radio traffic concerning his battalion commander and crew. He completed his assigned mission and hastened to join a flight of gunships in the vicinity of Hue. Ignoring the obvious futility of an attempt to approach the besieged compound, he quickly briefed his crew, determined his flight path and alerted his company commander on the ground that he was going to attempt a rescue. He was warned of the improbability of the success of any such venture and advised to stay clear of the area.

The tempo of fire from light and heavy automatic weapons directed at the ARVN compound had increased through the day. The walls had been assaulted by the NVA and mortar rounds were inflicting extensive damage to the compound.

Within the compound the C Company commander had been hit and the 227th's commander had been wounded again by fragments of the exploding mortars.

WO Ferguson acknowledged the transmission which warned him of the danger, and then announced that he was 2 minutes out on final approach and intended to try to effect the rescue.

The three accompaning gunships were suppressing with every weapon they had as WO Ferguson went in oblivious to the fire coming at him from all quadrants. His ship received hit after hit, shattering glass, ripping holes in the airframe and scattering debris throughout the cabin. He bore in straight for the compound with as much speed as his crippled Huey would give him.

The helicopter's skids were only inches from the railroad tracks over which WO Ferguson flew. He watched as the enemy gunners stood on roof tops, in doorways and in the streets, trying desperately to knock him and his ship from the air. The hail of fire was murderous but was being answered to some extent by his own door gunner and crew chief.

WO Ferguson flared his ship as he crossed the compound wall and pulled every ounce of power available in his effort to slow his aircraft for a landing in the only clear area within the fire raked walls. His skids had scarcely touched the ground when the wounded were loaded aboard, four Americans and one South Vietnamese who had taken a 12.7 mm round near his left ear.

As the helicopter was lifted from the blood-soaked pad, three mortar rounds landed on the spot where the UH-1 had been only seconds before. The concussion of the exploding rounds lifted the tail boom and spun the aircraft to the left. Without hesitation WO Ferguson continued the left turn and exited the compound by the same route used on the approach.

As he streaked for safety, the curtain of fire thrown at the departing aircraft was even heavier and more intense than it had been on the approach. Time and again WO Ferguson's aircraft was rocked by enemy fire. One of the escorting gunships had its fuel tank shot away and the pilot reported that he was going down.

In spite of the severe damage his helicopter had sustained from the enemy fire and shell fragments, WO Ferguson completed his mission, delivering his wounded passengers to medical facilities at Phu Bai.

His day of days was over. His fateful Huey would never fly again. WO Frederick E. Ferguson didn't have to risk his life—in fact, no one could have blamed him if he hadn't attempted the rescue under the circumstances. But he did, knowing the possible consequences. To call him a hero seems inadequate. But he is a hero in the fullest and most sincere sense of the word.

VIEWS FROM READERS

Continued from Page 1

pictures. Could you please ask anyone who served in the 12th Aviation Group from 1965 through 1968 and has any pictures or pertinent information concerning the 12th Aviation Group's development to write to me.

Any help that you can give us in this matter would be greatly appreciated.

W01 David A. Lindeman
Biographical Historian
Headquarters & Headquarters Co
12th Aviation Group (Combat)
APO San Francisco 96266

Sir:

Here in the frozen tundra, north of the 49th, we of the Canadian Armed Forces enjoy very much receiving and reading your magazine AVIATION DIGEST. All of your articles provide a valuable source of information and, although some do not pertain directly to our operations, it is interesting to note the many areas of concern that we mutually share.

One of our mutual areas of concern appears to be the attitude of our personnel toward safety. As evidence of this, I draw your attention to the safety slogan on the back cover of the January 1970 edition of AVIATION DIGEST which states: "Safety is like castor oil—hard to take, but results are assured." Most of our personnel realize the long term benefit of safety, like castor oil; however, there are a few who express their opinions of safety as being more like the immediate results of the medication. These nearsighted individuals have modified the simile to express their own opinions: "Safety and castor oil both give me. . . ." Hopefully the influence of magazines such as AVIATION DIGEST will help to bring these misinformed members into the fold.

Captain R. W. Slaughter
Staff Officer 2 Flight Safety
Training Command Headquarters
Canadian Forces Base Winnipeg
Manitoba, Canada

• **Thanks for the letter, captain—it'll either bring 'em into the fold or wipe 'em out.**

Sir:

I was very interested to read the article "The Kiowa Joins Up" by Major Robert S. Fairweather in the November 1969 issue. I was particularly interested in his comment that ". . . the fun and enthusiasm that marked the OH-23 versus the OH-13 unit rivalry can now be applied to two newer contenders: the OH-6A Cayuse and the OH-58A Kiowa." MAJ Fairweather presents some performance comparisons between the OH-6A and the OH-58A. As one who has been heavily involved in the development of the OH-6A, I feel MAJ Fairweather presented the performance comparison in a form that is biased toward the OH-58A. So, in the spirit of friendly rivalry, I am taking this opportunity to compare the performance of the two ships in a more realistic manner.

Two items of performance in MAJ Fairweather's comparison table give an erroneous impression. These are his data on Vne and rate of climb. Vne is a structural limit airspeed and is not necessarily related to maximum cruise speed capability, which is the important speed characteristic. The following numbers compare the maximum cruise speed capability of the two helicopters (chart 1).

As you can see, the *cruise* speed of the OH-6A is 10 to 16 knots faster than that of the OH-58A. Minor rating changes in the commercial version of the OH-6A have further increased its cruise speed. These rating changes are currently being offered to the U. S. Army.

The rate of climb comparison presented in MAJ Fairweather's article was for sea level standard conditions. Under more realistic altitude and/or temperature conditions the rate of climb comparison is as shown in chart 2.

As you can see, under realistic ambient conditions the rate of climb of the OH-6A is 10 to 40 percent higher than that of the OH-58A.

Kenneth B. Amer
Assistant Director
Aeronautical Engineering Division
Hughes Tool Company,
Aircraft Division
Culver City, Calif. 90066

Chart 1

COMPARISON OF MAXIMUM CRUISE SPEED

	OH-6A Cayuse*	OH-58A Kiowa**
Sea level standard		
Scout	118	110
Observation	120	111
Sea level 95° F		
Scout	110	97
Observation	115	99

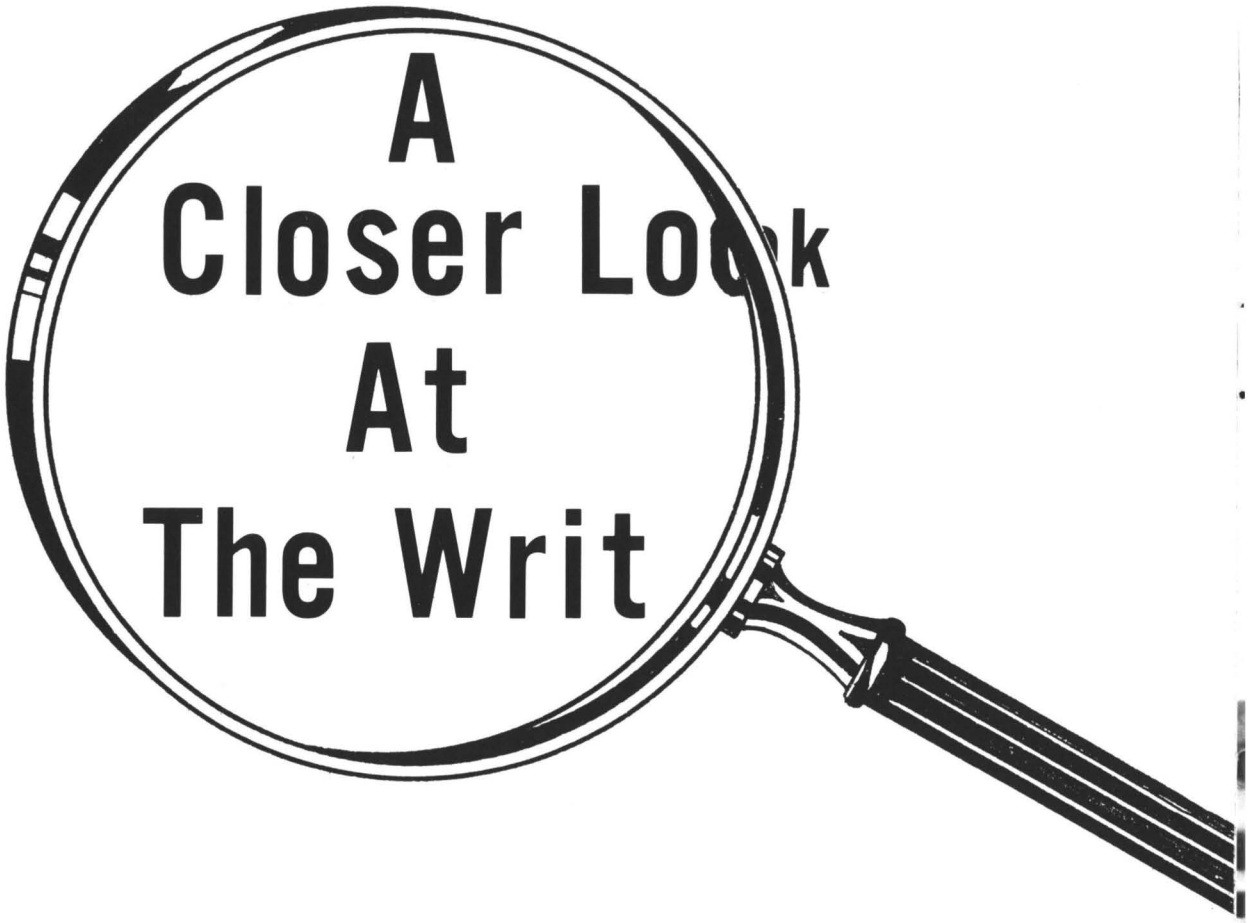
*From TM 55-1520-214-10 (Figures 14-5 and 14-21)
**From TM 55-1520-228-10 (Figure 14-18)

Chart 2

RATE OF CLIMB COMPARISON

	OH-6A Cayuse*	OH-58A Kiowa**
Sea level 95° F		
Scout	1,350	980
Observation	1,550	1,062
5,000 feet standard		
Scout	1,320	1,230
Observation	1,500	1,310

*From TM 55-1520-214-10 (Figures 14-16 and 14-20)
**From TM 55-1520-228-10 (Figures 14-12 and 14-4)



A Closer Look At The Writ

Much has been written and said against the annual writ, but the fact remains that year after year a large percentage of Army aviators continue to fail the exam on the first attempt. It might be to the advantage of those who took the test too lightly last year to take a closer look at the writ this year

Major James G. Moreau

A CLOSER LOOK at this year's Annual Writ Study Guide by most aviators seems to be in order in view of the statistics which were compiled on the 1969 examination:

- 43 percent of those who took the test did not know that both ceiling and visibility minimums are required for circling approaches.
- 12 percent failed the E-6B computer questions even though the problems were computed at round number increments.
- 8 percent failed to identify the right type of transponder on DD Form 175.
- 17 percent of fixed wing aviators did not know copilot requirements.
- 31 percent of all examinees failed the examination on the first try.

What most aviators don't realize is that the annual writ is not an examination as its official title would indicate. In its true form it is a review and updating of the aviator's knowledge. Most of the 21,000 aviators who annually take the exam look upon it as a copy of the previous writ. Most likely this is because questions that constantly appear are the ones that are missed most frequently by the examinees. For example, an analysis of the 1969 examination showed that 48 percent of the aviators answered the questions concerning approach minimums incorrectly. Therefore, questions pertaining to approaches or related questions are incorporated into the current examination. For instance, one question that has appeared on the last four annual written examinations in one version or another is: *When flying from a high pressure area to a low pressure area, your true aircraft altitude would be* ————. This type question will appear on this year's annual writ because 18 percent of the aviators last year answered the question incorrectly.

Over the years numerous articles and suggestions have been written concerning Army aviation's annual writ. Many of the articles condemn the writ and call for its elimination on the grounds that it is outdated, not fair or does not warrant the time and expense. Yet a large percentage of Army aviators continue to fail the examination the first time around. The failure rate would probably be higher if the tests were graded at a central point as are MOS (military occupational specialty) tests, GED (general education development) and other Army-wide examinations.

An analysis of last year's writ is applied to all questions in the current examination. As regulations and procedures change, they also are incorporated into the exam. If a regulation or a procedure is changed that pertains to a question that has a high failure rate on the writ, the question is rephrased or rearranged to cover the change or procedure. Because of this, many questions concerning communication procedures are asked on the examination. The 1970 exam covers this area in great detail due primarily to the failure rate and situations that are encountered in a radar and nonradar environment.

From the professional viewpoint, Army aviation attempts to update the aviator's knowledge annually. For many aviators, especially staff officers and those on Category B assignments, the annual writ and study guide are the only ways to stay current with changes in the professional Army aviation field.

To keep the annual writ and study guide as current as possible, changes in procedures and regulations are made available to the writer of the examination 6 to 12 months in advance of their distribution to the field. Changes in flight procedures that are related to FAA or FLIP policies are coordinated through the U. S. Army Aeronautical Service Office. Draft copies of aviation regulations which would affect the annual written examination are made available by the Assistant Chief of Staff for Force Development, Department of the Army. Close coordination by the U. S. Army Aviation School with the two above agencies guarantees that the latest and most current information is utilized on the annual written examination.

Each year a study guide is available to every Army aviator who is required to complete the annual written examination. Any aviator who conscientiously completes the study guide, which is in programed text format, should encounter no difficulty passing the writ. Some 43 percent of the annual writ examinees did not know that both ceiling and visibility minimums are required for circling approaches as stated in AR 95-2, paragraph 3-9g(2), and another 36 percent felt that a ceiling minimum was needed for a straight-in approach. Failing to look up all the answers contributed to most of the other misses. Remember, the writ covers changes—not memories. If you disregard the study guide you are throwing away at least 50 correct answers.

Aviators—beware of commercially available sunglasses. They're fine for girl watching but often can present problems on an approach to a pinnacle. Stick to the recommended N-15 sunglasses

To the air crewman: A noteworthy incident pertaining to impairment of vision recently was reported by a rotary wing instructor pilot. The IP was performing a check ride on a student in a UH-1. Sunset was fast approaching with the wind coming from the west. During an approach to a pinnacle landing the IP, noting the student was having difficulty, recovered and completed the landing. Upon questioning, the student complained he couldn't see well enough through his sunglasses. He was wearing commercially acquired sunglasses which may not have permitted the transmission of adequate light under dusky conditions. The IP was wearing Army issue N-15 sunglasses (in aviator spectacle frames). Under the prevailing conditions he experienced no visual difficulty.

The N-15 sunglass is a neutral density filter that transmits approximately 15 percent of the light reaching its surface. The wave length (color) of light transmitted is fairly uniform (all colors are transmitted equally well). This prevents color distortion. Other sunglasses, not produced to meet Army specifications, may transmit less than 10 percent of light and do so with excessive color distortion. This problem was discussed at some length in an article entitled "Rose Colored Glasses" in the October 1969 issue of the AVIATION DIGEST.

Every effort should be made to ensure utilization of the recommended N-15 sunglasses. Avoid commercially available glasses. They are usually designed for beaches, sun bathing and fashion, not flying. The aviator spectacle frames provide the advantage of minimum interference with field of vision due to their wire construction. Other frames, horn-rimmed and the like, frequently obscure the field of view. While no Army

regulation prohibits the use of other than the N-15 sunglasses, it is apparent that the safest course of action is to recommend their use at the exclusion of all others.

To the flight surgeon: New possibilities are being considered in the area of visual protection. Over the past few years the *clear* helmet visor has been recommended for routine use with the air crewman's protective helmet. This provides maximum protection of the eyes against fragmentary missiles and flash fires during both day and night flights. During daylight the N-15 sunglasses were recommended for use in conjunction with the clear visor. For night missions the clear visor alone is used. The problem that arises is that the N-15 sunglasses (in aviator spectacle frames) often do not integrate comfortably with the APH-5 or other helmet.

A recent study undertaken will evaluate the use of lightweight, durable, plastic lenses with appropriate coatings in conjunction with special frames designed to integrate comfortably with the SPH-4 helmet and other crewman's equipment. Another solution to this problem is the dual visor, but this usually adds undesirable weight to the helmet, thereby reducing its safety during crash force decelerations. Either way we must find the optimal way of protecting the air crewman's eyes both day and night. Do your share in promoting eye protection at your unit or station:

- Encourage the use of N-15 sunglasses with aviator spectacle frames during exposure to bright light or glare.
- Discourage the use of unapproved or unknown quality sunglasses.
- Promote the use of the clear visor to protect against fragmentary missiles and potential crash or flash fires both day and night.

ETERNAL VIGILANCE is the price of a good reputation.

That may sound a bit lofty, but none the less it is quite a significant statement if you care what others think of your professional capabilities.

I'm sure most of us have found a safety improperly installed or a cotter pin missing on a preflight. So, we consider ourselves fairly alert—and under normal conditions I suspect we are. Normal conditions are the exception, however, and circumstances may conspire against you if you let your guard down for a minute.

All of this professional reputation talk wouldn't be much good without an example to analyze. I do have one which serves to illustrate my point that eternal vigilance is a personal responsibility.

It began with a twofold mission: to drop off medical personnel at point A, and then proceed to point B for adjustments on the rigging of the left engine of our U-21A.

My copilot was an old hand, a senior Army aviator qualified in most fixed wing aircraft, including the C-45 and C-47 but not the U-21A. He had flown with us in the U-21 on several flights and had helped on preflight inspections. Through his own efforts he had familiarized himself with the aircraft until his presence was an advantage.

As for myself I had been flying more years than I like to admit (16) and have averaged about 350 hours per year. I had flown the U-21A for two years and had more than 300 hours in the aircraft. So, we had an experienced crew that should have had an easy flight.

We dropped off the medical people and arrived at point B about 1530 hours. After briefing the factory technical representative on the rigging problems of the engine, I turned the aircraft over to the local maintenance crew and retired to the BOQ for the night.

The next morning I was on the flight line at 0800 to give what assistance I could. After talking to the tech rep I decided to depart at 1230 for home base. I asked the maintenance sergeant to turn the aircraft around before refueling, as it was parked heading downhill and I expected a long 3 hour and 45 minute flight home.

The flight plan was filed for 9,000 feet and I was pleased that the weather guesser gave me a different wind figure from the earlier forecast. The new figure would give me about 3 + 20 enroute. The copilot and I went out about 1100 to preflight and load the aircraft.

Just as we arrived the fuel truck was pulling away and I noticed that the aircraft had not been turned around as I had requested. But due to the reduced enroute time, plus a good forecast at destination, I accepted the fuel load as it was.

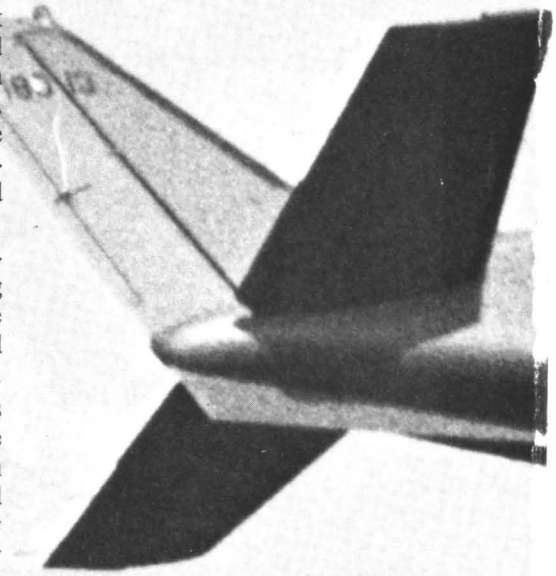
I started my preflight by checking the installation of the cowling which had been reinstalled. While I was making this check I noted my copilot preflighting the engines.

I asked the sergeant who was replacing a missing screw if he knew how much fuel had been put in. He said he didn't, but did know that they had not added any oil. I completed the preflight by closing all four fuel caps and we prepared to depart. The engine runup was very smooth due to the rerigged left engine and we broke ground at 1235 hours.

The climbout was without incident and after leveling off at 9,000 feet I trimmed the aircraft and turned it over to the copilot so he could practice ADF tracking. Within five minutes we ran into a deck of strato cumulus which proved to be quite choppy, so I asked control for a higher altitude.

As we started to climb I swept the engine panel and was surprised to see the oil pressure on the right engine drop off the 80-pound mark, then the 70 and finally sit fluctuating at 60 pounds. To say that I was surprised would be a slight understatement. I was watching the rerigged left engine like a hawk and felt slightly betrayed when the right engine started behaving in a peculiar manner.

Let me go quickly and lightly over the next 20 minutes. I won't bore you with a recount of the discussion which went on in the cockpit. We asked for and received clearance back to point B. As the oil pressure dropped we



watched the oil temperature gauge, but it did not rise. When the pressure got to 25 pounds (low red line is 40) I decided that I could no longer depend on the temperature gauge to give me an accurate reading, so I shut the engine down to avoid damaging it. Then I declared an emergency and descended to point B and landed.

We taxied to the ramp and shut down the other engine. When we opened the cowling you might

Don't let a mistake ruin your reputation as a professional. Only through eternal vigilance can you hope to earn the respect of your contemporaries

ETERNAL VIGILANCE

CW3 Norman F. Cates

guess what we found—the oil dipstick was left open and the stick had been pushed up about three inches allowing oil to escape. We had lost seven quarts, not enough to hurt the engine but enough to do a lot of damage to my ego and reputation.

How did it happen? I let myself be deluded by my knowledge of the skill and experience of my copilot. I believed that he had pulled a thorough preflight on the engines. This, plus the fact that no oil had been added to the engines, led me to fail to adequately perform the preflight. I should have checked the oil and caps *myself*. I was the aircraft commander; I was the one responsible to take the time and put out the effort needed to ensure a good preflight.

So, there you have it. Not the whole story because that still has years to go—years in which I will imagine that everyone I meet will be saying to himself, "Cates? Isn't he the guy that left the oil cap off the U-21?"

I realize that an occurrence such as I've described here would not in itself be overly damaging to one's professional reputation. But if a person becomes associated with too many incidents his reputation will suffer. To avoid this, one must be prepared to pay the price of eternal vigilance.

Charlie and Danny's

Dear Danny: On several occasions while flying Chinooks here in Vietnam, I have turned on the ventilation blower to cool down the cockpit and received a blast of air mixed with dust, grass and other particles directly in my eyes. As you know, we fly in and out of many dusty LZs and all sorts of trash collects in the lower chin bubbles. Can you give any help in this area?

CW2 H. V. G., RVN

Danny's answer: Your comment coincides with others that have been received here. At the last CH-47 publications conference, action was taken to prevent this potentially dangerous situation from happening to Chinook pilots. In soon to be published changes, caution notes will be added under paragraph 6-19 of TM 55-1520-227-10 and paragraph 6-22 of TM 55-1520-209-10 stating that the cockpit air control knobs should be closed prior to starting the ventilation blower, and opened slowly afterwards. Thank you for your interest and for your letter.

★ ★ ★

Dear Danny: I'm having maintenance problems with some OH-6 components and I am wondering if they are due to the aircraft being flown faster than the maximum allowed. I've heard it said by some pilots that these little machines will do an easy 140 knots. Since that's above the red line by almost 20 knots, I'm suspecting that some damage is done. Can you help me by cautioning pilots of the OH-6 to observe the red line?

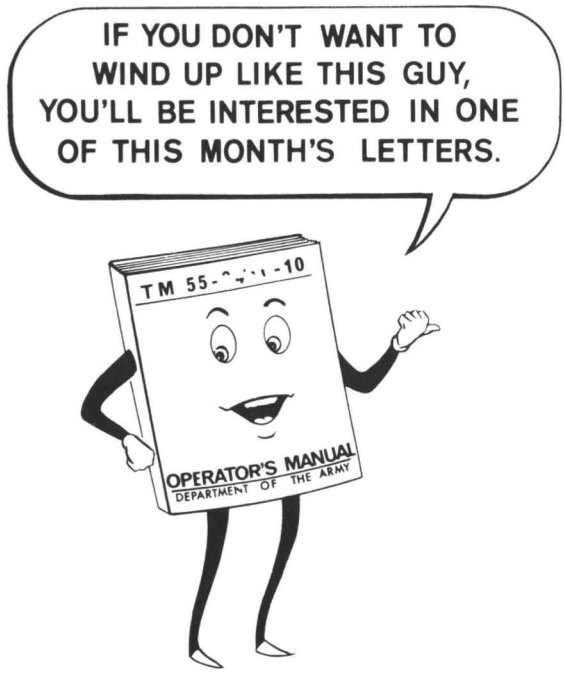
MAJ L. S. F.

Danny's answer: Consider it done. Page 7-3, chapter 7 of the OH-6 operator's manual (dash 10) shows 121 knots as Vne (velocity never exceed) at 2,400 pounds gross weight. That speed is for a density altitude of zero. Look a bit further to page 7-6 and check for a density altitude of 4,000 feet at 2,400 pounds gross weight. Vne under these conditions is 103 knots. Quite a difference! Exceeding Vne will cause damage to the aircraft. The damage may not show its ugly head the next hour, day or week and may even go undetected until a catastrophic failure occurs.

★ ★ ★

Dear Danny: Chapter 11 of the CH-54A operator's manual defines the CH-54 crew as one pilot, one copilot and a crew member. We're using a crew of four in our unit (pilot, copilot, flight engineer and crew chief). How about changing the manual to require a crew of four?

CPT B. C.



Danny's answer: The crew of three called for in the CH-54 operator's manual is a minimum requirement. It does not restrict the use of additional crew members for some operations. The fourth crew member may be added at the commander's discretion.

★ ★ ★

All DA 2028 forms arriving at the central mail desk at the U. S. Army Aviation Systems Command, St. Louis, Mo., are routed to the 2028 control desk. At the control desk they are assigned a four digit control number and then based on place of origin (CONUS, Europe or SEA) the necessary copies are made and sent to the applicable action office. The action office is given 20 working days to act on the recommendation. At present the policy is to give a 2028 originating in SEA first priority, followed by Europe and then CONUS, unless it is a safety of flight item or expedite action has been requested.

Write-In

RECOMMENDED CHANGES TO PUBLICATIONS
For use of this form, see AR 310-1; the proponent agency is The Adjutant General's Office.

Use Part II (reverse side) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

DATE: 15 Apr 70

TO: (Forward to proponent of publication) (Include ZIP Code)
Commanding General
U. S. Army Aviation Systems Command
ATTN: AMSAV-R-M
P. O. Box 209, Main Office
St. Louis, Missouri 63166

FROM: (Activity and location) (Include ZIP Code)
Eval Div, DOI, USAAVNS
ATTN: AJRDI-E
Fort Rucker, Alabama 36360

PART I - ALL PUBLICATIONS EXCEPT RPSTL AND SC/SM

PUBLICATION NUMBER	DATE	TITLE
TM 55-1510-201-10/5	Feb 69	Operator's Manual U-8F

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1	14-12			14-7		Add: Takeoff distance chart for minimum run takeoff. Reason: Takeoff distance for minimum run takeoff in recommended configuration (i.e., 65% flaps) is not available in this manual.

* Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE, OR TITLE
JOHN P. JONES, GS-13
Eval Div, DOI, USAAVNS

SIGNATURE: John P. Jones

DA FORM 1 DEC 68 2028 REPLACES DA FORM 2028, 1 APR 64, AND DA FORM 1598, 1 DEC 55, WHICH WILL BE USED.

The action office for 2028s concerning the operator's manual (dash 10) and the pilot's checklist (dash CL) is the Directorate of TDC&S (Technical Data Cataloging and Standardization). When a copy of the 2028 arrives at TDC&S a determination is made as to who will be involved in the staffing. If the recommendation affects publications only (format, etc.) it is staffed by the Technical Publications Division of TDC&S. If it concerns chapters 3, 4, 6, 10 or 11 of the operator's manual (dash 10) or the pilot's checklist (dash CL), a copy is forwarded to the U. S. Army Aviation School at Ft. Rucker, Ala., for staffing. A recommendation involving the remaining chapters of the operator's manual is sent to the applicable aircraft office within systems engineering. The office assigned to staff the recommendation is given a suspense date that falls within the original 20 working days (in the event that a considerable amount of coordination is involved the suspense date may be increased). When the staffing is completed and the recommendations are sent back to TDC&S a reply is sent to the originator on DA Form 200. If the change or recommendation affects safety of flight or a significant error in a maintenance or operational procedure, action is immediately taken to correct the discrepancy via an "in-house" change to the manual. Adoptable items which do not fall into this category form part of the material to be included in the next scheduled change or revision to the applicable manual.

★ ★ ★

Dear Danny: The CH-54A maintenance manual contains a warning about applying excessive collective friction and its affect on AFCS (automatic flight control system) operation. Shouldn't this warning be pointed out to all CH-54 pilots?

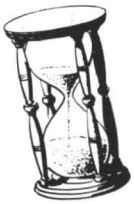
CW3 G. P.

Danny's answer: That's a roger. Look for the following caution in a future change to the CH-54 manual: CAUTION—Excessive friction on the collective pitch control will prevent proper operation of AFCS. Above is an example of how a suggestion is to be submitted on a DA Form 2028.

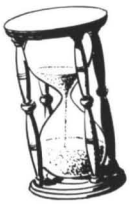
Remember—keep those cards and letters coming.

IT'S THAT TIME AGAIN

Captain Hubert J. Bell Jr.



No, it's not quitting time, but if you're a Vietnam returnee it may be time to renew your instrument ticket. In fact, it might be that time is running out



SAY, GEORGE, my birthday is coming up next month. Doesn't my tac card expire then?"

"That's right, and you have to renew it right away."

"O.K., but what are the requirements for renewal?"

"I don't know; you'll just have to look that up somewhere."

If these two aviators are typical Vietnam returnees after an initial aviation assignment there, they probably don't know the requirements and procedures for renewal of a tactical instrument rating. This is especially true since the publication of a new AR 95-63, which was effective 1 July 1969.

An aviator must reestablish instrument qualification within 60 days of date of expiration, or within 90 days from the date of reporting for duty if maintenance of qualification was not required in his previous assignment. Normally an instrument card is renewed during the 90-day period preceding the aviator's birthday, but when this is not accomplished the above criteria apply. An exception to these rules is granted to individuals returning from Southeast Asia (Laos, Vietnam and Thailand). These aviators whose instrument cards expired while assigned in SEA are granted six months in which to reestablish their instrument qualification.

If an aviator does not reestablish his instrument qualification within the appropriate time period, he will be temporarily suspended from flying status and placed before a flight evaluation board.

The requirements for renewal of a tac rating are specified in AR 95-63. The applicant must have successfully completed the annual written examination for the current fiscal year before an examiner is allowed to conduct the flight examination.

Uncertainty regarding the content of the tac renewal checkride seems to cause a great deal of confusion and apprehension. Below is a summary of the required procedures:

- Flight planning—using ATC or FOC procedures, whichever is appropriate, the applicant is required to plan a flight under simulated or actual instrument conditions.
- Equipment check—the applicant must determine that all instruments and equipment installed in the aircraft and considered necessary for IFR flight are functioning satisfactorily.
- Airway traffic control—the applicant must obtain simulated or actual airway traffic clearance.
- Enroute navigation—the applicant must demonstrate ability to navigate between radio facilities, determine position, locate proper frequencies and tune and use all radios required during the flight.
- Navigational facilities—the applicant must demonstrate proficiency in the following procedures for ADF and GCA only: establish his position using designated navigational aids of examiner's choice; follow assigned bearing or course after intercepting it at an appropriate angle; identify arrival at, or passage of, a station or fix; enter a specified holding pattern on any prescribed fix; execute ADF and GCA approaches; perform appropriate low visibility approach procedure.
- Recovery from unusual attitudes—the applicant must return the aircraft promptly to level flight using emergency panel (no gyro heading or attitude indicator).
- Autorotation—the applicant is required to follow correct procedures for the helicopter being utilized.

Autoratations and recovery from unusual attitudes will be performed only under simulated instrument conditions, and omission of these items will not mean the checkride is incomplete. There should be no absolute criteria established for determining an applicant's proficiency, but final determination of applicant's qualification is based on the examiner's judgment that he can safely pilot an aircraft under instrument conditions.

When the checkride has been completed satisfactorily, the tactical instrument rating will be awarded and appropriate entries made on the individual's DA Forms 759 and 66. If the aviator fails the renewal ride, he must successfully complete a reexamination within a 60-day period from the date of the original failure or be placed before a flight evaluation board to determine future flying status.

The tactical instrument concept, properly implemented, has made an important contribution to Army all-weather tactical capability. This capability is enhanced when the individual and his commander cooperate in ensuring that the tac card holder reaches the appropriate level of instrument flying proficiency not just once a year, but maintains it throughout the year.

Assignment: Vietnam

Army aviators assigned to the Republic of Vietnam will find a placement system which gives individual attention to each man as well as a choice of assignments. More improvements to this system and an upgrading of facilities at each replacement battalion are scheduled in order to ensure fast, efficient and considerate handling of aviator replacements

Lieutenant Colonel Billy E. Rutherford

THE U.S. ARMY'S largest and most varied aircraft inventory is located in the Republic of Vietnam. The aviation personnel population required to operate and maintain this vast fleet is constantly changing with daily arrivals and departures.

One of the many tasks of the U. S. Army Vietnam Adjutant General is to ensure that the correct number of qualified aviation personnel arrive to meet the replacement requirements. This article will outline officer assignment procedures and hopefully will provide answers to the questions regarding aviator personnel policies which are asked most often.

The replacement system has been improved during the past few years to expedite processing through the replacement battalion and to provide a choice of assignments. Additional improvements are scheduled which should further streamline the processing procedures and significantly upgrade the facilities at each replacement battalion.

Replacement aviators are assigned by the Aviator Assignment Branch which includes two field grade aviators. The Chief of the Aviator Assignment Branch historically has been an officer who served a recent tour with the Officer Personnel Directorate at Department of the Army and provides current information regarding assignment requirements and career planning. Continuous liaison is maintained with the Executive for Army Aviation Officer Personnel Directorate, Headquarters, Department of the Army, by telephone, letter and message. USARV assigns aviators directly to divisions, groups and other separate major subordinate commands.

Each aviator arrives assigned to the USARV Transient Detachment for further assignment to be determined upon arrival. The Transient Detachment is merely a strength accounting unit and is not in fact a unit with a commander and troops. Correspondence addressed to the Commanding Officer of the Transient Detachment is forwarded to the USARV AG section for reply. The In-country Designator Code (IDC) is shown on the special orders and indicates the arrival location in Vietnam. IDC 1 is Cam Ranh Bay where the 22nd Replacement Battalion is located. IDC 4 is Bien Hoa. Personnel arriving at Bien Hoa are processed at the 90th Replacement Battalion at Long Binh. All field grade aviators and the majority of the company grade aviators arrive at Bien Hoa.

Processing: Immediately after arrival at the replacement battalion, initial processing begins. All aviators are asked to complete an aviation qualification sheet. Company grade officers and warrant officers will complete an assignment preference sheet. For those aviators processing at the 90th Replacement Battalion, DA Form 66s, preference sheets and qualification sheets are hand carried to the Aviator Assignment Branch. For aviators arriving at Cam Ranh Bay this information is teletyped to the Aviator Assignment Branch. While the assign-

Recent flight school graduates who satisfy most of the replacement requirements in Vietnam benefit from the improved assignment system which has gone into operation during the past years

ment is being processed the central issue facility at each replacement battalion will issue field equipment, tropical fatigues, jungle boots, drawers, T-shirts, handkerchiefs, socks and towels. Nomex flight suits, gloves, leather boots and weapons are issued by the unit supply at ultimate destination.

Assignments: The Aviator Assignment Branch receives the DA Form 66 or teletype sheet from the replacement battalion and begins the process of matching the replacement aviators to unit requirements. Assignments for lieutenant colonels and majors are made to a specific unit approximately 60 to 90 days prior to the officer's programed arrival date. For this reason these two grades are not required to complete an assignment preference sheet. The assignment officer will call the replacement battalion and have all field grade officers and CW3s and CW4s paged and discuss their specific assignment. For company grade officers and warrant officers the preference sheet is received and compared with the existing requirements. Every effort is made to assign aviators to one of the five units which may be listed on the assignment preference sheet.

The 1st Aviation Brigade has 60 percent of the aviators so it receives a like percentage of the replacements. The airmobile 1st Cavalry and 101st Airborne divisions receive the second largest number. Small units such as artillery groups and separate brigades usually require only one or two aviator replacements a month. Once the assignments are made, the DA Form 66 and assignment instructions are returned or a teletype message dispatched to the replacement battalions. This assignment information is posted to a bulletin board and the good or bad news known. In the event an aviator wants to discuss his assignment, he may call the assignment officer by using one of the telephones available at the replacement battalion. The 22nd Replacement Battalion at Cam Ranh Bay has a direct line to the USARV Director of Replacement Operations.

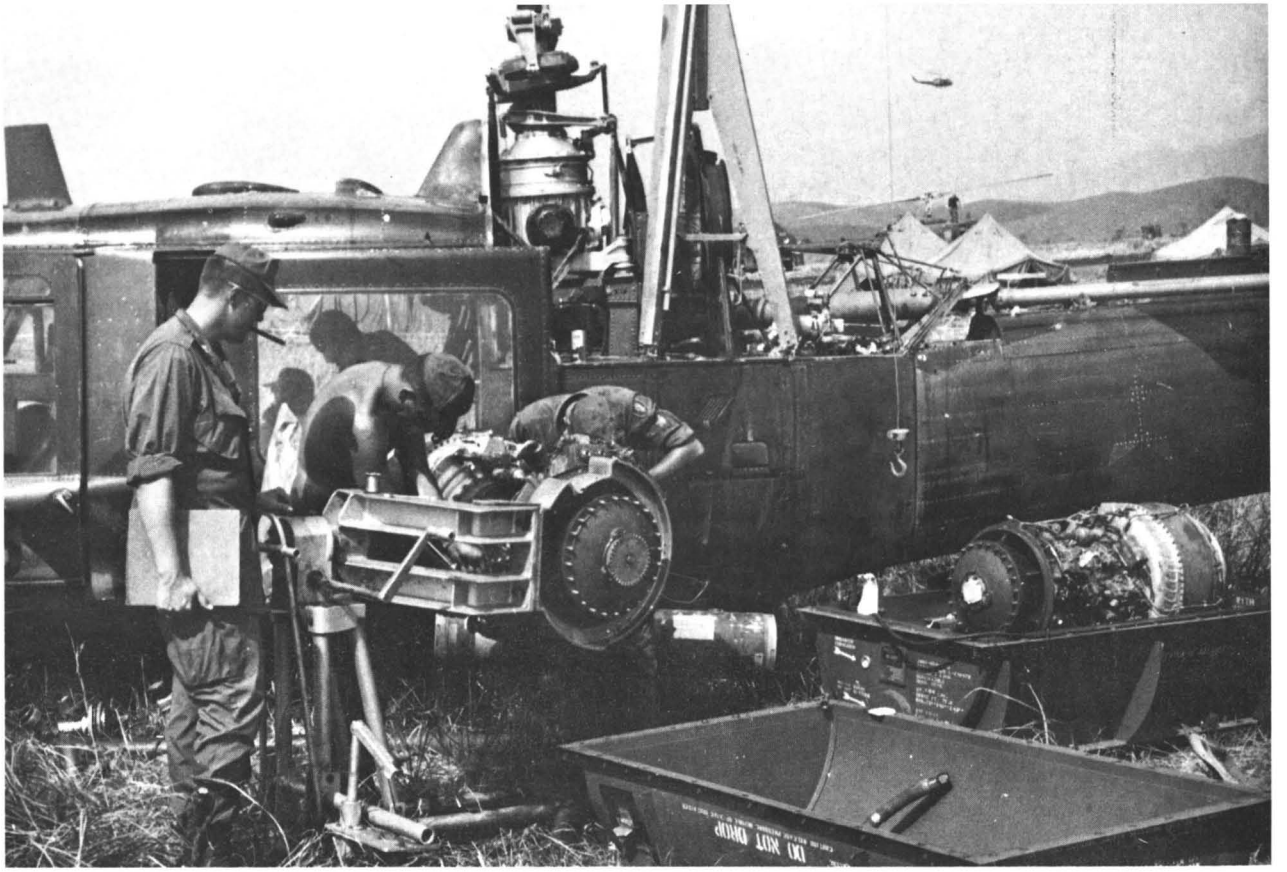
Transportation: The goal of the replacement battalion is to process all officers and have them on the way to their units in less than 24 hours. If the unit is close to the replacement battalion, the unit will pick up replacements by vehicle. In the case of more distant locations, Air Force aircraft are used to transport personnel.

After the aviator arrives and is settled in his unit he may have additional questions about other areas which will affect his assignment while in Vietnam. A few of these areas are:

In-country transition training: OH-6 and OH-58 transition training is conducted in USARV. An aviator assigned to fly these aircraft will receive transition training at his unit or a formal course conducted by a USARV training team. The USARV Cobra training team conducts AH-1G transitioning for approximately 400 aviators each year. Aviators are selected by their units to attend and must have six months remaining in Vietnam to be eligible. Transition training in the AH-1G is only authorized in the formal course conducted by USARV. Unit transition training is conducted as required in U-6, U-1 and U-21 aircraft.

In-country transfers: Normally all company grade officers and warrant officers spend their full tours in their initial unit of assignment. In-country transfers are usually made only when necessary to adjust the number of personnel rotating from a unit in a specific month or in conjunction with a six-month extension of foreign service tour.

Aviation personnel management in the Republic of Vietnam means a constantly changing personnel population for the largest Army aircraft inventory in the world. The size of this giant inventory grew with the concept of mass airmobile operations



One of the many tasks of the U. S. Army Vietnam Adjutant General is to ensure that the correct number of qualified aviation personnel arrive to meet replacement requirements. Every effort is made to assign an aviator to the unit of his choice

Field grade officers usually change jobs at least once during their tour, particularly those who are programed for command.

Ground duty: USARV Regulation 614-10 authorizes aviators to be assigned to Category B positions. Aviators assigned to Category B positions after arrival in Vietnam remain charged against the aviator strength of the unit and a nonaviator or aviator replacement cannot be requisitioned. In view of this restriction, the number of aviators in Category B positions is very limited.

Aircraft commanders: Each major subordinate commander has established minimum criteria for designating aircraft commanders in those aircraft which require aircraft commanders. The requirements are generally based on flying hours and duty performance.

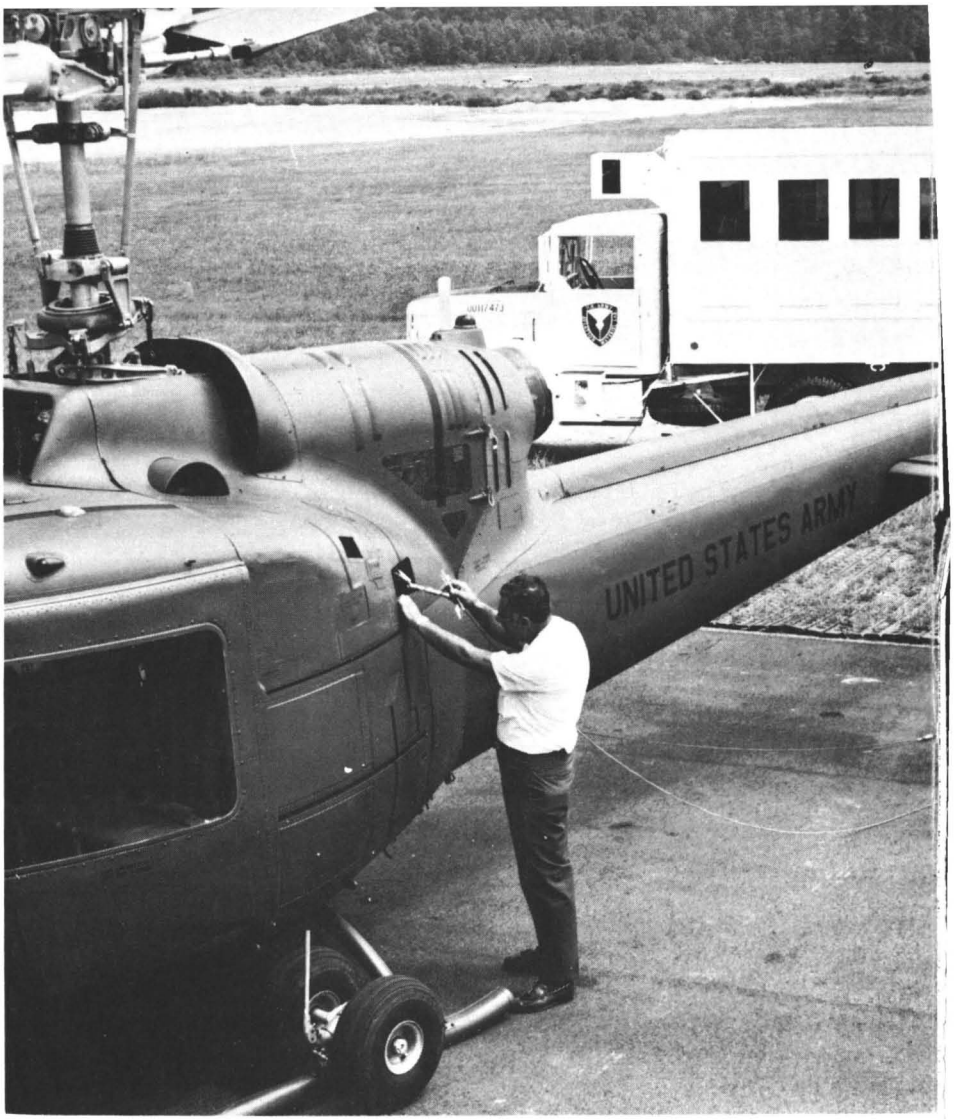
Foreign service tour (FST) extensions: USARV has approving authority to act on requests for FST extensions if the individual has not completed eight months of his FST and is not on DA orders. Otherwise the request must be forwarded to the appropriate career branch at DA. Under a recent DA program aviation warrant officers serving on their initial obligated volunteer tour may extend their FST for six months and be released from active duty upon their return to CONUS. All personnel extending their FST for six months are eligible for a 30-day leave in CONUS or other location of their choice.

One of the bright spots in the picture of Army aviation in Vietnam today is that TOE grade authorizations and actual fill are nearly identical. Gone are those bleak days when majors occupied most of the key slots in an airmobile company. Some may grimly recall a pair of companies that had two platoons of majors. The current officer-warrant officer mix is very close to the ratio desired by DA. Only in extreme and unusual cases will an officer be assigned to a TOE position which is authorized a lower grade.

In Army aviation we are very fortunate to have the finest aviation training program in the world. On numerous visits and discussions with commanders throughout Vietnam, aviation personnel continue to be highly commended for their performance of duty and professionalism. Nothing can substitute for the actual conditions encountered in flying combat missions; however, the newly assigned aviator becomes a combat veteran in a very short time. You are the *new guy* on the first day only—the replacement flow is continuous and the time goes quickly. It is with a tremendous amount of pride that we who are in Vietnam watch our young aviators accept the challenge of combat flying and support of ground units with unequaled dedication and professionalism. Our motto "Above the Best" has never been challenged.

SONIC ANALYSIS

S. Blair Poteate Jr.
Chief, Aircraft Support Systems
U. S. Army
Aviation Materiel Laboratories



A NEW CONCEPT in Army aviation maintenance—a sonic analyzer designed to "listen" to engines and transmissions and detect malfunctions and anomalies —currently is being field tested at the U. S. Army Aviation Materiel Laboratories (AVLABS), the Army's aviation research center at Ft. Eustis, Va. Potential savings through the use of such devices could amount to millions of dollars per year.

The present AVLABS program is designed to establish correlation between the condition of helicopter components as established by the sonic analyzer and the actual mechanical condition of those components.

In this program, UH-1 helicopters at Ft. Stewart/Hunter AAF, Ga., are subjected to a sonic analysis when they come in for power train component removal for overhaul.

The sonic analyzer built for AVLABS by Curtiss-Wright Corporation is believed to be capable of monitoring mechanical condition of the rotating elements in the engine, transmission, shafting and tail rotor gearboxes by comparing the acoustic patterns of the components in question with the acoustic patterns of components known to be in good mechanical condition. Comparisons can be made in order that various faults may be isolated.

While the magnitude of savings possible with such a system in actual operation is impossible to calculate, the following gives a good idea: at present, UH-1 main transmissions are scheduled for removal for overhaul every 1,100 hours. A very large percentage of these components which are removed because they have reached their time between overhaul (TBO) are found *to have no mechanical discrepancies upon teardown.*

The cost of this overhaul procedure for the UH-1 main transmission is approximately $2,500. It is the desire of the Army to be able to extend this time between overhaul substantially, or eliminate it altogether, and by use of such devices as the sonic analyzer establish that the power train components are in good working order at any given time.

In addition to TBO removals, pilot/crew complaints about aircraft performance anomalies also generate many engine teardowns, inspections and reassembly operations which, with the proper monitoring and diagnostic equipment, could usually be eliminated or at

Maintenance Through Sound

This teardown and inspection process takes place at the U. S. Army Aviation Depot Maintenance Center (ARADMAC) at Corpus Christi, Tex., where Army and Bell Helicopter Company engineers are gathering data.

Some of the features of the analyzer, either existent or anticipated, are:

- Simplicity—three microphones are located on the aircraft while it is running at approximately ground idle for about 10 minutes.
- The entire power train is analyzed at one time.
- The systems discretionary ability-expectations are that the analyzer will be able to detect component malfunction at a very early stage, which will allow maintenance personnel to be aware of an impending problem and monitor its progress.

The last point above is extremely crucial in that it will allow continuing flight operation for a large number of hours if experience has shown the identified anomaly will not progress to a catastrophic condition within that number of hours.

To verify this and to establish the rate of progression of typical power train system failures, a correlary research program is being considered which will introduce known malfunctioning components into a tied down helicopter to establish the rate of failure progression and corresponding signal identification using devices such as the sonic analyzer.

The sonic analysis approach is just one of many current AVLABS programs which are aimed at increasing Army aircraft availability and safety through better maintenance systems. The system has obvious application to commercial aviation.

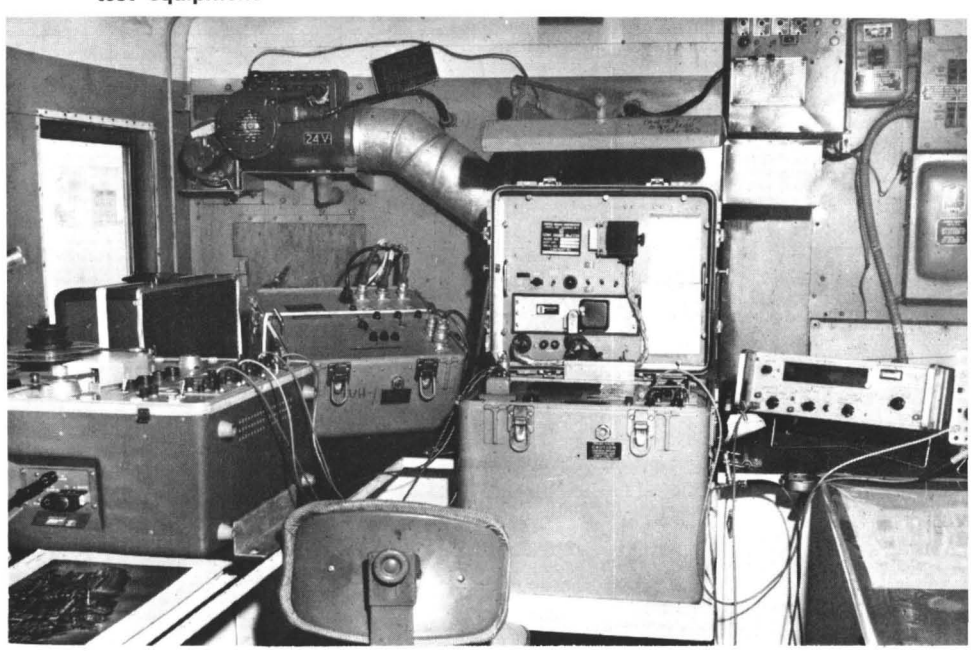
least the problem isolated so that complete teardown would be unnecessary.

A word of caution: The sonic analyzer is not an operational maintenance tool. It is still in the research stage and there are questionable and unknown areas which must be resolved.

To determine the potential of this system, AVLABS engineers are evaluating a fairly large sample of UH-1D helicopters (about 100) at Stewart/Hunter.

In an effort to establish the accuracy of the sonic analysis, the components removed for overhaul are being followed through the mechanical teardown and inspection process at overhaul to provide information on their actual mechanical condition for correlation.

Left: Microphones are installed by AVLABS engineers on a UH-1D for sonic analysis tests at Hunter Army Airfield, Ga. The test van is in the background. Below: The interior of the test van with the sonic analyzer in the center and ancillary test equipment



WE WERE CLIMBING out over the mountains surrounding Bao Loc in the Republic of Vietnam at midnight when we inadvertently went IFR. Before we could react the copilot and I both experienced vertigo. Fortunately, we discovered that we were in a left descending turn before it was too late and managed to get the UH-1 back into straight and level flight.

It was time to ask for help: "Paris Center, Kingsman 341, 80 miles northeast of Saigon, 4,000 feet, request radar vector to Bien Hoa, over."

Sure enough Paris Center was ready to help. "Roger, Kingsman 341, squawk Mode 3 Code 0400 and ident for radar identification."

This was just great! We needed help; they were trying to help, but we couldn't remember how to work the transponder (next time there is a class on the transponder we'll pay attention!). However, there was one feature about that handy gadget that we did know—that was how to squawk emergency which we did.

"Roger, Kingsman 341, we have radar contact 70 miles northeast of Saigon. For a radar vector to Bien Hoa turn to a heading of 250 degrees, maintain 4,000 feet, over."

Finally after an hour of sheer terror for the crew we were able to break out and return safely home.

Another war story? Yes, definitely.

An unusual story? No, this story is one of many, but like most war stories there is something to be learned from it.

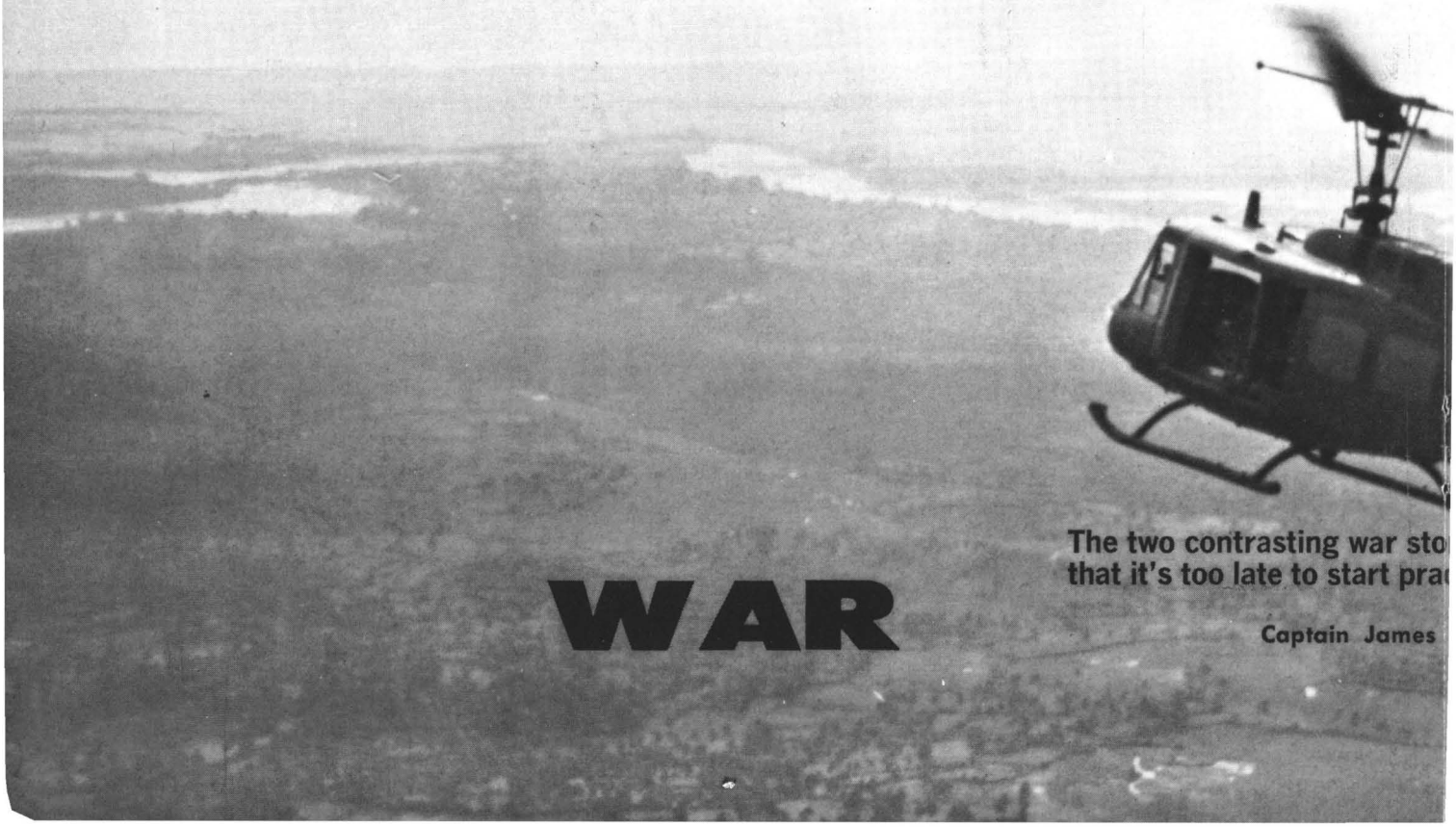
First, what was the weather forecast that night at Bao Loc? Who knows? The crew of that aircraft certainly didn't know. The fact that the area surrounding Bao Loc had been completely overcast each morning for a week hadn't made much impression on the crewmen either.

But in fairness to the crew it must be remembered that it is extremely difficult to get a forecast when working in a tactical field situation with no reporting facilities available.

Second, was the mission so vital and urgent that it had to be flown at midnight over mountainous terrain? In this instance it was entirely an administrative mission. The aircraft was to be returned from a field position to the unit's home base for scheduled maintenance. The crewmen, however, had more important things on their minds. The Bob Hope show was scheduled the next morning in Long Binh and if they couldn't get back they wouldn't be able to find seats—a classic case of overemphasizing the importance of the mission.

Third, were the crewmen prepared to go IFR? Well, they should have been—but they weren't. Instead of continually polishing their IFR techniques they both had carefully packed away their hoods. Of course after this experience out came the hoods whenever the opportunity arose.

Last but not least, did they know their equipment? Obviously no! They did, however, know just enough to get them out of trouble but they weren't able to make the



WAR

The two contrasting war sto
that it's too late to start pra

Captain James

instruments really work for them.

For contrast, let's now consider a war story experienced by the pilots of Kingsman 208:

We were resupplying Landing Zone (LZ) Charley late one afternoon and the ceiling continued to deteriorate. As we lifted off the LZ, we felt .50 caliber rounds pass through the UH-1. The nose of the helicopter took several hits and the pressure gauges went out. We didn't know what other damage was done, so we landed back in the LZ. Even before checking the aircraft we had decided that if at all possible we had to get out of the LZ because it was still insecure and we might not make it through the night there.

A thorough inspection revealed that the lines to the pressure instruments were severed, but that was the extent of the damage. Luckily, our crew chief was really on the ball. One of our helicopters had been shot down in LZ Charley the day before and was still lying there on its side. He ran to the downed aircraft and removed the lines that were so vital to us and installed them in 208. He proved that he knew his job and now it was our turn.

The ceiling had continued to drop, so the only way out was an IFR climb to the clear condition we knew was on top. We had flown out to LZ Charley above the broken layer of clouds and then had threaded our way through the clouds to get into the LZ. The sky was now completely overcast but we did know the weather situation.

We checked our tactical map to determine our minimum enroute altitude and plotted an approximate course to the nearest nondirectional beacon. We were ready to go. Luckily, both of us had been practicing hooded flight at every opportunity and now it was going to pay off.

After climbing through the layer of clouds we broke out at 3,000 feet. With our ADF tuned to the station we were on our way.

One quick call and we were set, "Hue Approach Control, Kingsman 208, 15 miles west of Phu Bai, 3,000 feet VFR-on-top, request ADF approach upon arrival, over."

Back they came, "Roger, Kingsman 208, you are cleared for the approach upon arrival. Call leaving 3,000, over."

It was just like they preached in flight school—instrument approaches really work. We broke out of the clouds 50 feet above our minimums and the airfield in front of us was the greatest sight in the world.

Above are two contrasting war stories. First, the inept crewmen who stumbled around the sky but eventually got home in one piece. The only thing they did right was live to tell their story. Compare them with the cool, competent men who took the IFR encounter in stride because they were prepared for it. What do these war stories tell? Both crews had the same aviation training and skills but only one had the sense to practice these skills to maintain proficiency. As both cases show, it is too late to practice when it's IFR!

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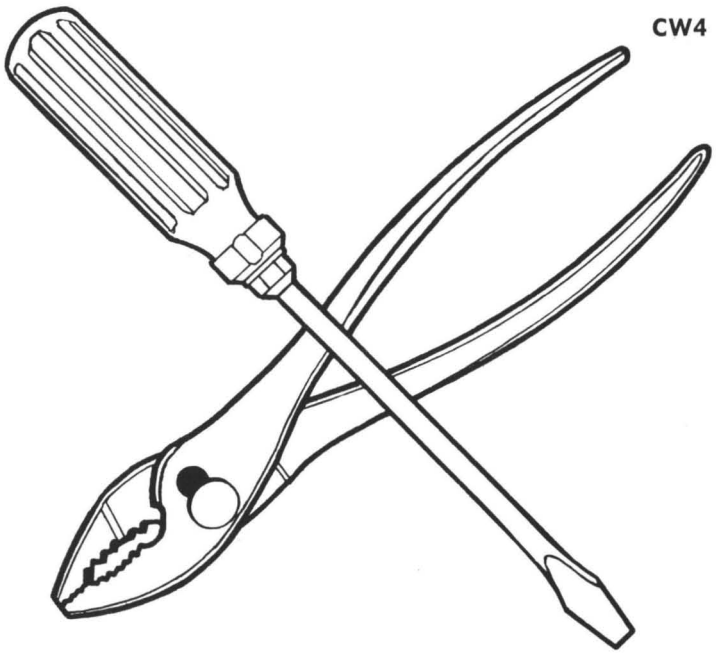
ticing when you're IFR

W. Filson

STORIES

MAINTENANCE TRAINING IN THE WARRANT CAREER PROGRAM

CW4 William H. Chambers



Students attending the Warrant Officer Career Development courses receive 84 hours of maintenance instruction. Is this practical?

HOW DOES ONE teach maintenance to a highly skilled aviation maintenance technician? More pointedly, is it practical to teach maintenance to warrant officers who have spent many years as pilots and have little or no interest in acquiring the additional skill of a maintenance officer?

These two questions spawn a third one which also must be asked: Does the training of which we speak represent a significant gain in job performance which will justify the expense and time lost to the Army while the warrant officer is in a training status?

Such questions faced training personnel during initial research to determine subjects that would be taught to students attending the Intermediate and Advanced Courses offered by WOCARD, which is the Aviation Warrant Officer Career Development Division, Department of Special Aviation Training, U. S. Army Aviation School, Ft. Rucker, Ala.

To clarify the approach taken in solving the problem of which maintenance subjects to teach, it became necessary to examine the students' backgrounds and previous training. In this regard, it was found that the selected warrant officers were of two distinct categories: the aviation warrant officer who had been trained primarily as a pilot and had a limited background in other fields; and the aircraft maintenance technician who might or might not be rated.

Generally speaking, the warrant officer in the first category finds that his combat assignments, training activities or proficiency flying requirements, as the case may be, consume a great deal of his time. Moreover, this category of warrant officer frequently finds that he also must perform additional duties which require added expenditures of time and effort. In many cases, the individual has not received any job-related formal training prior to assuming such additional duties, although he may have had previous experience in related areas as an enlisted man or warrant officer. For the most part, the performance of this individual has been outstanding, thereby indicating a high degree of personal initiative and willingness to learn.

Concerning the warrant officer in the second category, we find that he is already well trained maintenance-wise and normally has had extensive field experience before he arrives to attend the WOCARD courses. One could therefore contend that for such an individual maintenance training, per se, would be redundant.

With these factors in mind, the Army decided to select only those maintenance subjects having a broad application to both groups. This decision was reflected in the two approved programs of instruction (POIs) for the course. The POIs include 84 hours of maintenance instruction arranged into several specific areas, the first being maintenance management.

Maintenance management subjects cover the introduction to management; an overview of those studies and theories from which current Army management doctrine has evolved; the functions of management from an organizational viewpoint; and the managerial functions of the manager.

Since much of the success of any endeavor depends on established management controls, two of the more frequently used control techniques are stressed in the course: Program Evaluation and Review Technique (PERT) and Line of Balance (LOB) charting. Also, since maintenance data is vital to the management effort of the entire maintenance system, The Army Integrated Equipment Record Maintenance Management System (TAERS) is discussed as a management tool at all levels of command. The methods of collection, storage and application of data accumulated at the various management levels are covered in detail.

So that the student will understand total resource management, it was considered necessary to acquaint him with the Army's financial management system. To make the student vitally aware of procurement and management procedures, the Army's budgetary planning and programing system is briefly described covering budgeting from the time that financial plans are approved to the time when Congress appropriates the requested funds.

The financial management plan is discussed with emphasis on stock funds, industrial funds and consumer funds. The Army management structure (AMS) and appropriations are explained so that the student will be able to identify how appropriations and costs are related to plans and programs. Particular emphasis is placed on the Army's cost reduction and management improvement programs to ensure that the student understands the importance of savings and cost consciousness on the part of all personnel.

Instruction then moves into more traditional areas beginning with a review of maintenance principles, categories of maintenance and detailed descriptions of the maintenance support structure from national level down to using units. In this line, the areas of supply and maintenance are covered to ensure that the student is familiar with maintenance and supply publications and requisitioning and distribution procedures. This instruction is in some respects redundant, particularly so for the maintenance technician; however, as with other subjects, the knowledge gained and the value of refresher training cannot be overlooked.

The last area of maintenance taught is the field of maintenance personnel training. The military occupational specialty (MOS) structure, MOS requirements, personnel qualifications, on-the-job training, the procurement of school quotas and the importance of progressive training to develop personnel are discussed. The special qualifications for technical inspectors and supervisors are emphasized together with the supervisor's responsibilities in developing his personnel.

Included in the POIs are guest speakers from the U. S. Army Aviation Systems Command (AVSCOM) and the U. S. Army Aeronautical Depot Maintenance Center (ARADMAC) who present information on the organization, mission and capabilities of their activities. The use of such guest speakers throughout the program keeps the student abreast of new ideas pertaining to maintenance trends and problem areas.

From the foregoing, the critical reader may discern areas in which training does, to some extent, overlap previous training undergone by the maintenance technician and perhaps by the nonmaintenance types. Granted, but it was determined that such an overlap was necessary to permit the warrant officer primarily engaged in flight duties to understand the entire gamut of the Army's maintenance program.

At present, many of the subjects noted are taught to both the Intermediate and the Advanced Course classes with slight variations in the Advanced Course to allow greater indepth investigation and "hangar flying." This action was based on the premise that the Advanced Course students were a great deal more experienced.

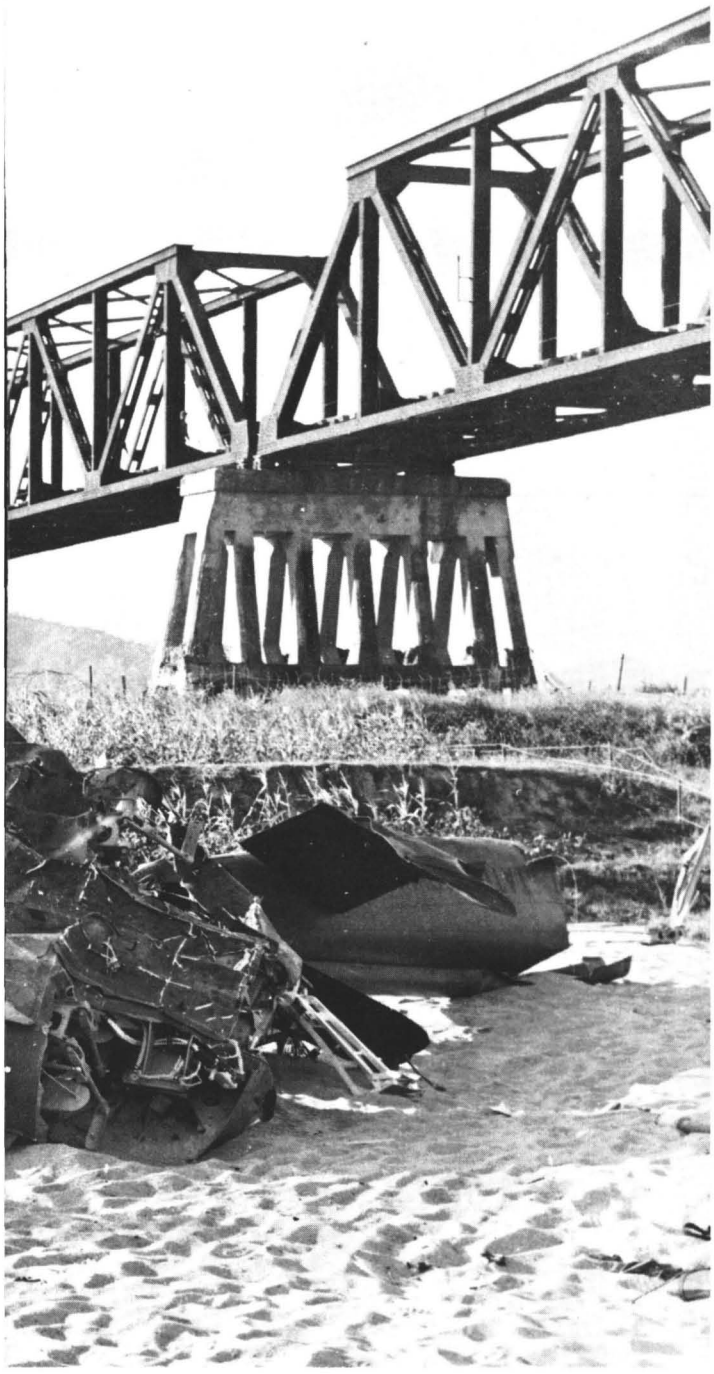
This then answers the first two questions posed at the start of this article. The answer to the third question can only be provided by the graduates of the Aviation Warrant Officer Career Development Course. However, there appears to be little doubt that when the career course knowledge gained by the aviation warrant officer is added to the drive and professionalism which is so inherent to this dedicated group of soldiers, the resulting sum will provide the third question with an unequivocal answer of *yes*.

CRASH SENSE

the following 28 pages prepared by the U. S. Army Board for Aviation Accident Research

Photograph taken by AC of following helicopter shows UH-1H just prior to impact with bridge

This accident was caused by a lack of supervision and training of the individual from the date of his entry into the aviation program . . .



MISPLACED CONFIDENCE

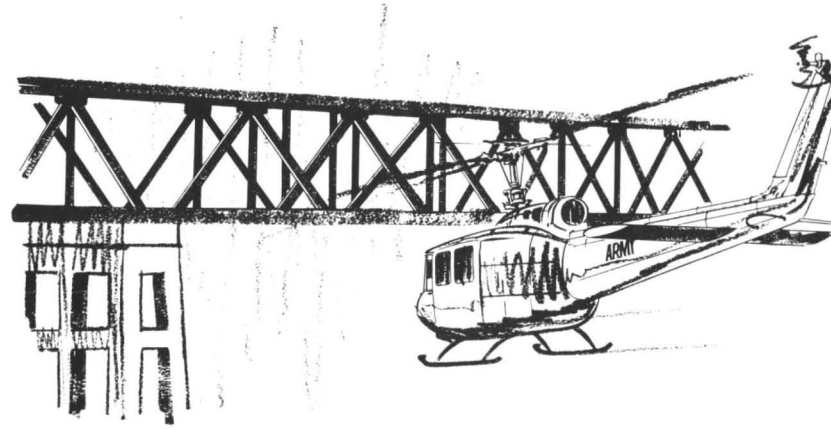
WHEN A MAN steps into the cockpit of an Army aircraft for the very first time his confidence is at its lowest point. After he discovers that an airplane or helicopter won't eat him alive and that it is actually possible to get one of the things into the air and back on the ground in one piece, his stock in himself rises gradually like a blue chip investment. A little later on, when he realizes one day that he no longer has an instructor aboard, he may experience a brief attack of butterflies in his stomach. But as he gains experience, his belief in his capability starts an up curve.

Healthy self-confidence is a necessary part of every successful pilot's personality. Without confidence in himself and his aircraft, a man becomes overcautious and cannot succeed in the flying business.

Given what we may loosely call experience—in the case of pilots, around 500 hours—it is possible for self-confidence to get out of hand. When this situation arises, a pilot is likely to overlook dangers and convince himself that accidents which happen to others can't happen to him. Like Horatio Frozzleforth, he suddenly becomes the world's greatest aviator and no risk is too great for him to challenge.

Except for misplaced confidence, how could you account for an instrument-rated pilot who flew into known heavy weather with gusts up to hurricane force? It was estimated that he was doing over 200 knots when he hit the ground. Or the pilot who

MISPLACED CONFIDENCE



When the pilot announced to the trail ship that he was going under the bridge, there was no attempt made by his copilot or the pilots in the trail ship to discourage him from doing it . . .

filed a 19-hour VFR flight plan and wound up plastered against the side of a hill after flying 10 hours? Or still another who had a U-8 engine fail and landed at an elevation more than 13,300 feet above sea level? Once on the ground, he restarted the dead engine, ran it up and took off *without having the engine inspected.* Shortly after takeoff, the same engine caught fire and failed again. This time the results were disastrous. If these pilots' confidence in themselves had developed properly, these accidents would not have happened.

Consider the following case of a UH-1H pilot who had a total of 540 flying hours. With a copilot, crew chief, gunner and passenger aboard, he was flying one of two helicopters which had completed their mission, refueled and were flying along a river when they came to a railroad bridge.

AC of following UH-1H: ". . . We both low-leveled down the river. I was taking photographs and my pilot was at the controls. As we approached the railroad bridge, the pilot of the lead ship called on UHF, said he was going to fly under the bridge and asked if I would follow. I replied, 'No, I'm too short.'

"As we closed on the bridge, I had my pilot drop back to give the pilot of the lead ship room to climb over the bridge, as I did not think he would try to go under. As he got to the bridge and passed the critical point, we began a climb over the bridge. The lead pilot appeared to begin a flare and cyclic turn as he got to the low bridge. His turn was apparently started first and his flare about half completed when the main rotor hit the bridge and shattered and the head struck and was sheared. At this point, the aircraft hurdled forward and we lost sight of it as my aircraft crossed over the bridge at 100-200 feet.

"Reaching the far side of the bridge, I saw the aircraft lying on its top right quarter with a small fire starting in the hellhole. I took control, made a tight 270-degree turn and landed just as the crew chief jumped from the wrecked aircraft and a minor explosion started a fire over the whole rear half of the wreckage. . . ."

Crew chief: ". . . As we were coming to the bridge, he reduced speed and started dropping lower to clear the bridge. Just before impact, I thought to myself that we were too high to clear. I believe the pilot thought so too and he tried to flare to avoid the bridge, but it didn't work. I heard a loud bang and then the helicopter rocked violently.

"That's the last I remember until we hit the ground. I released my seat belt and crawled out from under the wreckage which was already burning. The passenger staggered out behind me and fell. I grabbed him and pulled him away from the wreckage. By this time, the helicopter had landed and the gunner and crew chief of the other aircraft were trying to get the copilot out. I went over and helped until he was free of the wreckage."

Questions asked crew chief: "Did you hear any transmission from either of the pilots in the aircraft following you, attempting to discourage your pilot from flying under the bridge?"

"No, just the transmission about being too short to try it."

"Have you ever heard of anyone making an attempt to fly under this bridge?"

"I had heard that four aircraft had gone under the same bridge before, but I don't know whether they

were from this unit or not. I had flown under the same bridge with the pilot about 3 weeks before the accident."

The pilot and gunner were killed in the impact and fire and the copilot had several broken bones and serious burn injuries. The crew chief and passenger escaped with minor injuries and the helicopter was a total loss.

Analysis: "The lower span of the bridge was 32 feet above ground level. The height of the UH-1H from the skid to the top of the mast is 13′ 7½″. Attempting to fly under the bridge allowed little room for error in judgment, particularly when a 4-foot high barbed wire fence running parallel to the bridge had to be taken into consideration. Compensating for the height of the wire and the aircraft, with a foot clearance for the skids prior to passing under the bridge, maximum clearance to the lower span was approximately 13′ 6″. With this small margin, even the slightest control movement could have put the aircraft at an altitude at which it could not clear the lower span. At the last moment, the pilot appeared to sense that his main rotor was not going to clear and attempted to flare and turn left in an effort to abort the maneuver."

Flight surgeon: ". . . . Any aviator who attempts to fly under a bridge just to show he can do it demonstrates a definite lack of maturity and professionalism. Apparently the pilot had hovered under this same bridge before. When he announced to the trail ship that he was going under the bridge, there was no attempt made by his copilot or the pilots in the trail ship to discourage him from doing it. . . . All aviators should be reminded that they must not only maintain a high degree of professionalism in their own flying, but should also counsel other aviators against unsafe flying practices when they encounter them. Standardization of flying procedures is mandatory for a safe flight program."

Established cause: "Failure to use common sense and good judgment, combined with a total disregard for established safety standards."

Probable or suspected factors: "Inadequate training (safety and standardization).

"Lack of professional attitude within the unit.

"Poor supervisory development with regard to the above factors."

Recommendations: "Evaluation of supervisory personnel in these areas: safety, standardization and operations. Appropriate steps should be taken to ensure that a positive program to raise the level of professionalism within the unit is taken in these areas.

"An intensive safety program should be initiated and incorporated in the SOP.

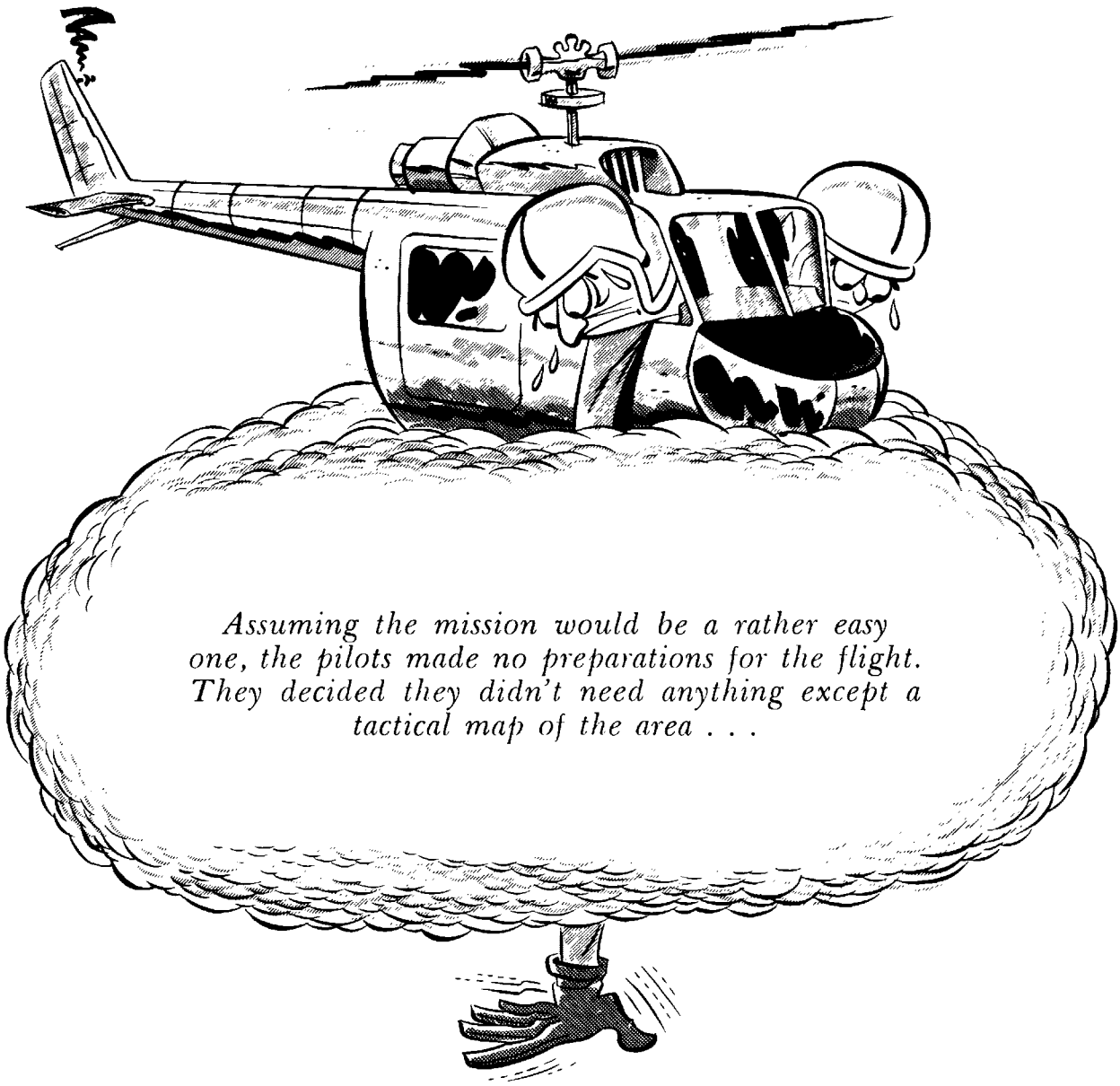
"A mission commander should be designated for all multiship operations."

Reviewing official: "Concur with the findings and recommendations. The SOP has been rewritten to specify that mission commanders will be designated for all multiship missions. Positive steps have been taken to improve the air discipline of the unit. Increased emphasis is being placed on pilot responsibility and orientation within the battalion and particularly in this unit. The unit commander has made unauthorized low level flying an Article 15 offense. He has conducted classes on this accident, emphasizing professional flying and aircraft commander responsibility. . . ."

Indorsement: "Concur with the findings and recommendations, with this comment: Contributing cause factors for this accident began with this individual's entry into the aviation program. Within the time allotted for basic aviation training, individuals of this caliber should be identified and the necessary action taken to either increase their training cycle or eliminate them from the aviation program. Lacking a training program of this nature, additional time must be allocated here to further train these individuals. This additional training time detracts from the combat efficiency of an operational unit.

"Common sense and sound judgment are hard subjects to teach an individual. However, given the proper guidance over a period of time, an individual will develop these traits. This accident was caused by a lack of supervision and training of the individual from the date of his entry into the aviation program to the date of the accident. Somewhere throughout his training, some instructor, supervisor or commander should have identified his lack of maturity and judgment and avoided placing him in a position to control the fate of his fellow soldiers."

Are you your brother's keeper? When it comes to protecting lives and vital combat equipment, the answer must be a resounding YES! Not only should you demonstrate the qualities of mature confidence and judgment in your own flying, you should demand it from others.


Assuming the mission would be a rather easy one, the pilots made no preparations for the flight. They decided they didn't need anything except a tactical map of the area . . .

MILK RUN

CW3 Julius A. Jordan

Education and Prevention Department
USABAAR

AFTER COMPLETING AN 8-hour day of flying, two weary young UH-1 pilots reported to operations to check their mission for the next day. "I see we drew the milk run for the general's chase tomorrow," said the pilot.

"Yeah," replied the copilot. "It should be a day of rest."

Unknown to them both, their anticipated day of rest could easily have lasted an eternity. Assuming the mission would be a rather easy one, with nothing to do but fly chase on another helicopter, the pilots made no preparations for the flight. They decided they didn't need anything except a tactical map of the area where they would be operating. The only thing they were concerned about was the 0730 reporting time.

The following morning they reported to the general's pilot who asked if either of them had an instrument ticket of any kind. Neither did. Thinking they might be able to have the entire day off, the two pilots said they would go back to the unit and send over two instrument qualified pilots for the mission if necessary. The general's pilot, an instrument examiner who had logged many hours of actual instrument time, said there should be no need for instrument flight, so the mission was not changed.

Waiting for the VIPs, the pilots caught up on some reading while the crew chief checked the aircraft over and answered questions from the door gunner who was on his first mission in Vietnam. It seemed he would never run out of questions. "Where are we going?" "How long will we be gone?" "How high do we fly?" The crew chief, a somewhat older man and a bit of a grouch, mumbled his answers.

The VIPs arrived at 0845 and boarded the lead helicopter. The tower cleared them for takeoff and both choppers began climbing out. The two aviators in the chase aircraft were discussing their destination when the voice of the pilot in the lead came over the FM radio, saying their mission was a trip to Nha Trang and back.

The route of flight was direct to Qui Nhon, then down the coastline to Nha Trang. The expressions on the faces of the crew in the chase ship changed to ear-to-ear grins. The pilots and crew chief had heard about the officers and EM clubs at Nha Trang, where they could get real honest-to-goodness ice cream and hamburgers—something none of them had seen since they arrived in Vietnam.

The lead helicopter climbed to 5,000 feet. Visibility was 15 miles and there wasn't a cloud in the sky. About 40 minutes after takeoff, they were over Qui Nhon and turning south, heading into a 15-knot wind. This seemed no immediate problem for they should be in Nha Trang with plenty of fuel to spare in about an hour.

Puffs of clouds began to form. The further south they traveled, the more clouds there were. At this point, the two chase pilots were not worried because there were still holes through which they could see the ground. When they reached Tuy Hoa, they were at 8,000 feet and still climbing to stay on top. The holes had closed in and the two young aviators were getting concerned. The climb was continued to 10,000 feet. At that altitude, they were just clipping the tops of the clouds. The pilot of the chase ship, now very much concerned, called the lead pilot and reminded him that neither he nor his copilot had an instrument ticket.

"I don't think we will have any trouble," the lead pilot replied.

The new door gunner, listening to the conversation between the pilots and the other aircraft, felt the tension and anxiety as the two helicopters continued on their mission. The two chase pilots were between fear and sheer panic at this point. There were no approach charts in their helicopter, they did not know the frequencies for Nha Trang and neither pilot had ever been south of Qui Nhon. They

did not know what to expect, except what they saw on the tactical map, and that was nothing but mountains—high mountains.

After 2 hours and 10 minutes of flight, the lead pilot called, gave them the GCA frequency and told them to call and ask for a GCA approach. The frequency was dialed, but the UHF was inoperative. Contact was established with the lead ship on FM and their problem passed on to the pilot who, the two chase pilots hoped, had all the answers. He did. "Lock on to me," he called, "and we'll fly formation to the airfield."

They couldn't have locked on much tighter than they already were. The lead pilot reported he was starting to let down. At 9,800 feet, they were in the clouds. The first 2,000 feet were not so bad. The chase pilots were beginning to think they had it made. Then they encountered rain at about 7,500 feet and turned on the windshield wipers. This helped some, but not nearly enough.

The chase pilot called the lead pilot and asked him to turn on his navigational lights. This also helped, but the pilots of the chase ship were still in trouble. They were losing sight of the lead ship for 2 to 5 seconds at a time when they encountered heavy rain and clouds. Those 2 to 5 seconds seemed an eternity. Then they could see the lead helicopter again—sometimes about to run into it—sometimes about to lose it. To avoid collision, they lowered collective to the full down position and flared, causing the rpm to increase, the warning light to flash and the audio signal to almost burst their eardrums. When they were about to lose visual contact, they would apply full power which, on many occasions, caused the rpm to drop to 6000 where the warning light and sound again added to their panic.

When the pilot would lose sight of the lead helicopter, the copilot would holler, "I've got it!" When the copilot would lose visual contact, the pilot would yell, "I've got it!" Once, the copilot shouted, "Is he turning into us?" The pilot, realizing the copilot had vertigo, took control again. He lost the lead ship and called, "Do you see him?" The copilot answered, "No!" The pilot held everything steady for what seemed an eternity again, then there was an ear-splitting, "I've got him!"

To make matters worse, the windshield directly above the pilot was cracked, allowing water to run down it into the radio console. The crew chief heard their conversation about the water, gathered some rags and began wiping away the water. Dropping from a high altitude of cold air to a lower altitude of warm air caused condensation to form on the inside of the windshield. Luckily, the crew chief was there with the rags to clear it. This sequence of events continued compounding until they reached an altitude of approximately 500 feet, where the copilot shouted, "There's a hole under us!"

The pilot, wanting only to get on the ground, slowed to about 40 knots, bottomed the pitch and allowed the helicopter to fall through the hole, breaking out about 30 feet above the ocean. A rock about the size of a basketball court was the only thing in sight. He tried to contact the lead pilot, but the FM radio had been shorted out by the water coming through the cracked windshield.

The two pilots hovered over the rock for about 15 minutes, trying to calm themselves and decide what to do next. Unable to land on the rock, they finally decided to hover westward until they came to some type of land. At that time, the visibility had reduced to 50 feet.

They had hovered for about 5 minutes when, to their amazement, they found themselves over a taxiway. Not knowing where they were and still in a state of shock, they remained at a hover over the end of the taxiway several minutes before they decided it was a friendly installation. Hovering down the taxiway, they saw the lead helicopter and landed behind it. When the engine was shut down, they had 120 pounds of fuel left.

Shakily, they got out and found they were at Nha Trang Airfield. The lead pilot thought it was the funniest thing he had ever heard. It was apparent he did not know how close he had come to being killed, both in the air and on the ground.

When the crew chief spoke for the first time, he asked the gunner why he was in the back corner with his jacket pulled over his head. He said he was scared and received three loud amens.

After 2 hours, with no improvement in the weather, the VIPs appeared for the return trip and the lead pilot asked the two chase pilots if they were ready. In case you can't guess their answer, two *much* wiser aviators returned to their home base 2 days later. After this, they planned every mission thoroughly and never encountered another they considered a milk run.

Lieutenant Colonel James R. Massengill *Data Center, USABAAR*

CAN A COMPUTER PREVENT AIRCRAFT ACCIDENTS?

TO IMPLEMENT an effective accident prevention system, a vast accumulation of factors which can influence aviation accidents must be maintained. A complete account of all major and minor accidents, incidents, forced landings and precautionary landings must be assembled. This collection of information must contain facts about the aircraft involved, the personnel involved and any environmental factors which influenced the mishaps.

All elements of data pertaining to maintenance and performance of aircraft prior to and during an accident must be made available. Failure of mechanical parts of aircraft can be prevented if pertinent data concerning previous failures can be obtained.

To determine the effectiveness of safety devices and escape mechanisms, the performance of such equipment must be included in the reporting system.

Full information about all individuals influencing an aviation mishap must be reported. Of primary importance are their physical and mental condition, education, training and experience. Facts concerning the time, weather and geographical location of the mishap are important in evaluating the accident causes.

To acquire the vast data base necessary for recording aviation mishap information, an extensive program of data accumulation must be implemented. The benefits resulting from an automated information system are entirely dependent on the validity of the information that individuals provide the system. Those individuals responsible for reporting mishaps from the field must make certain the data elements are correct and comprehensive.

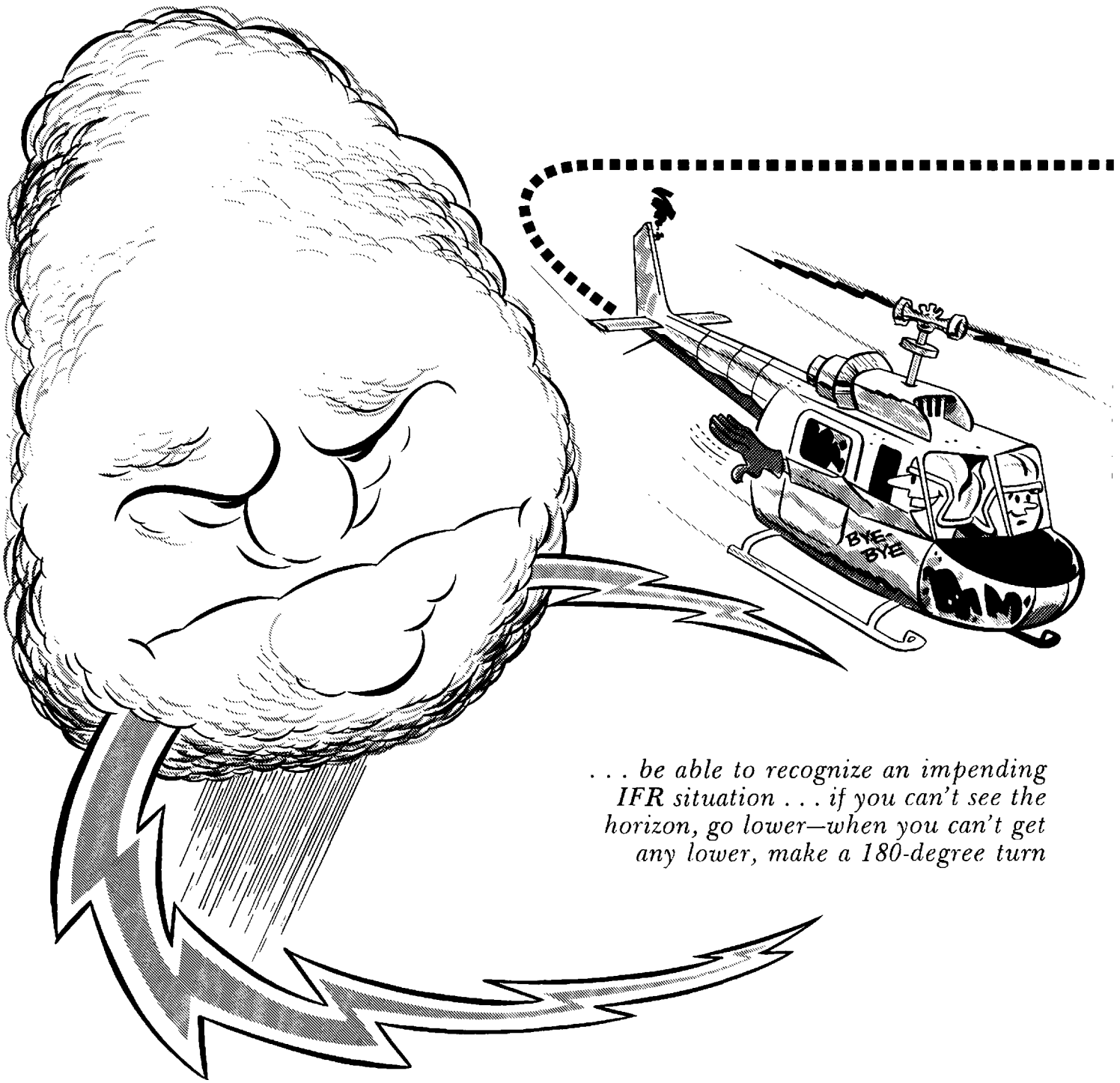
Before any information can be included in the data base, it must be validated. Computer edits must be performed to make certain the data entering the system is correct in content and format. The information is then stored in either a direct access storage device or magnetic tape. These records are kept current to be used as a source for all inquiries and statistical analyses.

Once a round data base has been established, information must be selectively retrieved, collated, summarized and organized so the causes of aircraft accidents can be identified through comprehensive analyses. The computer can rapidly and accurately accomplish these functions and it can effectively assist in analyzing the information it provides. However, some man must eventually evaluate and interpret the results of the computer's labors and make the final decision that a causative agent has been identified.

Once a causative agent has been determined, information must be provided to the command, agency or manufacturer who has the responsibility and resources to eliminate the problem and prevent similar mishaps. Although the computer plays an important role in developing background information and supporting statistics that will be of value in implementing corrective procedures, it is man who must take the initiative and implement the corrective action.

The introduction of modern third generation computer equipment has greatly increased the effectiveness of data management. Mass storage and direct access capabilities now available afford users the ability to address large amounts of data and receive desired output products in a short period of time. Remote inquiry stations allow immediate access to the data base at all times.

USABAAR will install such a computer system this year. This computer will form an essential element of the overall USABAAR Management Information System (MIS). No, the computer alone will not prevent aircraft accidents. It will be an essential research tool for USABAAR and it will assist in the identification of factors responsible for aircraft accidents. Implementation of the MIS will provide a research capability within the Army to prevent accidental damage and destruction of Army aviation combat resources. Although the new system will provide capabilities necessary to prevent aircraft accidents, *only individuals can prevent the tragic and needless waste which results from aircraft accidents.*



. . . be able to recognize an impending IFR situation . . . if you can't see the horizon, go lower—when you can't get any lower, make a 180-degree turn

INADVERTENT IFR

CW3 George J. Combs

Plans and Programs Department
USABAAR

IN THE FALL OF 1967 I had just completed an IFR flight between LZ English and An Khe. While the crew was busy refueling, I started daydreaming of the wife, kids and home. After a few moments of this pleasant pastime, I was snapped back to reality by this transmission on guard: "Mayday! Mayday! This is Bulldog 345 [fictitious call sign]. I have just gone IFR over An Khe Pass, altitude 6,300, heading 340. Mayday! Mayday!"

This transmission was followed in a few seconds by another. "Mayday! Mayday! This is Bulldog 345. I am IFR over the An Khe Pass, altitude 5,800, heading 290. Mayday!" At the end of that transmission, both An Khe and Phu Cat approach control tried to answer and give assistance, but it was apparent by the next transmission that the pilot was beyond human help. It was almost a scream: "Mayday! Mayd—My God! Someone help me!"

At that point, I switched the radio off. I could not stand to listen anymore. I don't know if the pilot was able to get out of his predicament. I had no wish to confirm what I felt would be a catastrophic accident.

If an accident did occur, many people would probably say it was the result of pilot error or weather. To me, the pilot had become the victim of an *attitude*.

First, I'd like to take a look at this attitude, then show how the help the pilot had pleaded for could have been provided by the personnel of his unit. I can best describe this attitude by statements I have heard many times. See how many you recognize:

"A helicopter doesn't have any business going IFR." This ignores the fact that helicopter pilots in Vietnam or any other part of the world are going to become involved in inadvertent IFR situations. This statement is usually made by someone who has not taken a very close look at the existing situation; or a man who is instrument rated, but lacks confidence in his ability to fly in IFR conditions; or one who has failed to maintain proficiency as an instrument pilot.

"Why do I need an instrument ticket? It's nothing but a yoke I have to worry about once a year." Again, these people have not taken a very close look at the situation. Statistics show that an untrained pilot who gets into an inadvertent IFR situation, without an instrument trained pilot in the cockpit to help him, will last 1 to 2 minutes before he gets to a point where he is beyond any assistance outside the cockpit.

"The tactical instrument program doesn't do any-

thing but get people into trouble." This statement is just not true. The program is not intended to make the man a proficient IFR pilot, but to provide his next unit a good solid foundation to build on.

I think you will find the majority of the young pilots fresh out of flight school eager to learn and do a good job. They will readily follow any example or receive any training offered by older, more experienced hands and supervisory personnel in the unit. So, if you don't like what you see in your young aviators, you might take a look at the attitude and training program of your unit.

I had the good fortune of instructing in the tactical instrument program. I have also instructed and flown IFR with recent flight school graduates in Vietnam. I found the majority to be very receptive to instruction and capable of IFR flight when given the proper follow-up training. As a sidelight, I could not tell the difference between individuals who had received their instrument training in UH-1s, and those who had been trained in TH-13Ts.

The man I found the hardest to train was an individual who had spent a year in another assignment without any follow-on training prior to his arrival in Vietnam. I had to start with basic instruments to bring him up to the standards that would be expected of him.

"You just can't fly instruments in a tactical situation. Besides, there isn't any requirement for it." This also ignores the fact that pilots are going to get themselves into inadvertent IFR situations. I must admit that, during my last tour in Vietnam, I found most areas do not have the facilities to conduct tactical IFR flights. But it would be hard to find an area where you could not get all the assistance you needed if you went IFR inadvertently.

From another angle, the Army's biggest requirement for helicopters is tactical. So, if the requirement for a tactical IFR capability does not exist, where does the requirement for a helicopter IFR capability exist? I believe that for Army aviation to perform its mission satisfactorily, we must have tactical IFR capability.

"I'm not going to fly any synthetic trainer. The thing doesn't even fly like a helicopter." These people are right in the last part of their statement, but the procedures are the same. A good synthetic trainer instructor can put you into almost any conceivable emergency situation, teaching you to deal with emergencies in an atmosphere where a mistake will not be fatal. I have never heard a proficient instrument pilot say anything derogatory about synthetic trainers.

I realize that, in most cases, synthetic trainers are not available in Vietnam. But if you are at a stateside installation, a synthetic trainer will help you maintain or improve your instrument capability before you get into a situation where you need it.

What can you do about a training program at the unit level? The first thing is to check your aircraft. If the flight instruments (i.e., heading indicator, attitude indicator, altimeter, airspeed, turn and bank, vertical speed and magnetic compass); radios applicable to your area of operation (i.e., UHF, VHF and FM); navigational aids applicable to your area of operation (i.e., VOR, ADF and ILS); and transponder are inoperative or unreliable, put the aircraft on a circle red X, restricted from IFR and marginal weather VFR flight. It does not make good sense, except for a tactical emergency, to send a pilot out in marginal VFR weather if the aircraft is not capable of IFR flight.

Next, find out what IFR facilities are available in the unit's area of operation. If they are inadequate or insufficient, find out what can be done to improve them. Bring this to a responsible person's attention.

Find out if you have enough FLIP publications for each aircraft. (There is a complete set of FLIPs for RVN.) Make sure the pilots know these publications are available and know how to use them. Let the pilots know what IFR facilities are available to them, including frequencies, call signs and location.

Put a hood in each helicopter. Find out what personnel are qualified and make them instrument IPs. Start an examination program, to include a written examination on the unit's area of operation.

When a pilot first arrives in the unit, his local area orientation should include a complete briefing on the IFR facilities available to him. He should receive at least 4 hours of hood training and a chance to practice, at least once, every IFR approach in the unit's area of operation.

This training program will not require a lot of additional flight hours. Most of the training can be conducted in conjunction with normal everyday missions. With a little prior planning, it won't take more than 5 additional minutes to make a practice IFR approach when you are going into an airfield that has an approach available. A lot of the hood training can be accomplished enroute during single ship missions.

Recent flight school graduates should be given their first taste of actual IFR flight with a proficient instrument IP in the left seat. This can be accomplished by contacting the nearest ATC or radar facility for clearance and conducting the flight under radar control with GCA when the opportunity presents itself.

Start posting the weather on your operations board and make sure the pilots read it. In a lot of areas you can get a telephone link to the weather people. Find out the radio frequencies for weather personnel in your area and make the pilots aware of them. I have heard some pilots say the weather forecasters in Vietnam are not too accurate. I used their information for a year on my last tour and found them to be every bit as accurate as they are stateside.

If you don't take off stateside without checking the weather, this should apply double in Vietnam. Friendly cow pastures to put down in and wait out the weather come few and far between in that area of the world.

Start talking about IFR flying in the unit. You will be surprised at the number of people who will join the discussion once you have broken the ice. A lot of them will have good ideas.

Here are some things pilots should know to avoid inadvertent IFR situations, or prevent disaster if they cannot avoid them:

First, be able to recognize an impending IFR situation. This is the system I use—if you can't see the horizon, go lower—when you can't get any lower, make a 180-degree turn.

If you must continue, realize you are flying into an area of low ceilings and reduced visibility and reduce your airspeed, if possible, to increase the time you have to react. Be prepared for the transition to instruments if you do go IFR.

If you see an area of heavy rain, go around it or turn back. The heavy rain may well indicate a thunderstorm. If you become IFR in that situation, there is not too much anyone can do to help you. The only solution to thunderstorms I know of is avoidance.

What should you do to prepare yourself for an inadvertent IFR condition? The first thing to remember is not to panic. Know where you are and who you are going to contact for assistance. If possible, call them before and tell them who you are and where you are. Tell them there is a possibility you will become inadvertently IFR and if you do, you will be contacting them for assistance. They will probably tell you which transponder code to squawk and the frequency to contact them on. When you are clear of the danger, be kind enough to thank them for their standby assistance.

Be sure the copilot knows what you want him to do if you go IFR. One man should handle the radios and the other the aircraft. Never assume he knows this. Tell him which duty you want him to perform.

I have often heard the statement, *"If you become IFR, make a 180-degree turn."* In most situations in a helicopter this will cause you nothing but grief because a helicopter will most generally be low level when it becomes IFR. I don't know of many pilots who can transition to the gauges and complete a 180-degree turn in a matter of seconds without becoming inverted or losing a lot of altitude. The best solution is to start a climb to clear any obstructions in the area. Complete your transition to instruments before trying any turns.

Don't be afraid to ask for assistance. So what if you do become VFR again in 5 minutes? You haven't hurt anything. The reason we have IFR facilities is to provide assistance.

In conclusion, I believe the biggest problem is the lack of confidence. Too many pilots prefer to ignore the possibility they can become involved in an inadvertent IFR situation until it is too late to do anything. They take solace in the same attitude in other pilots. There is no reason to be afraid of IFR flying as long as you maintain a high degree of proficiency and approach it in a professional manner.

"a sense of URGENCY"

"NOW CLASS," exclaimed Miss Jones, breaking one of the cardinal rules of teaching by turning her back to her students to write on the blackboard, "we're going to review arithmetic for our 6-weeks test tomorrow. I want you all to pay close attention."

Little Johnny in the back row waved his hand urgently and squirmed at his desk. Miss Jones began to copy a long list of multiplication and division problems from her exercise book. As the chalk flew over the blackboard, emitting a shrill squeak, Johnny squirmed faster. Desperately, he waved his hand in the air and coughed loudly. Miss Jones con-

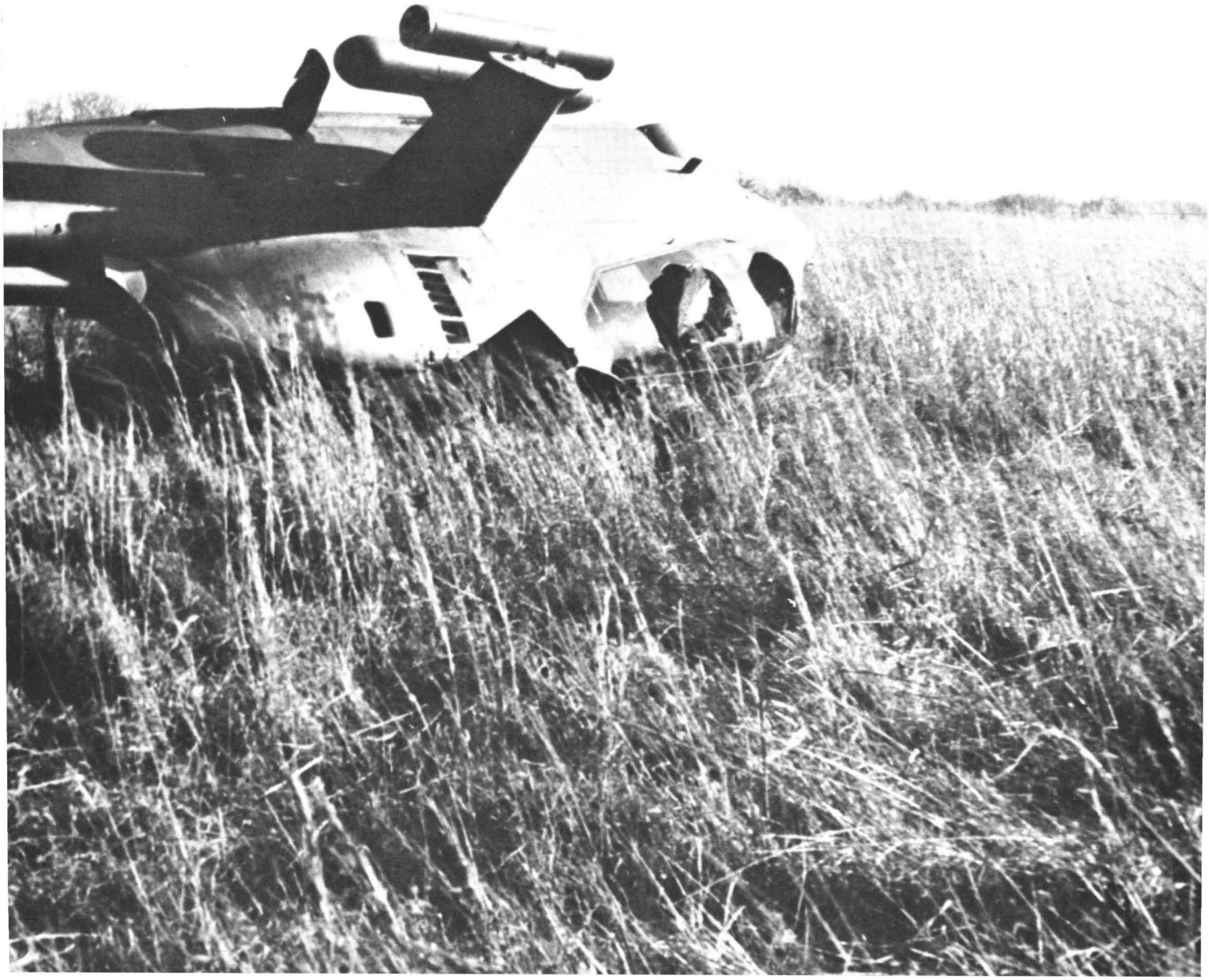
tinued to write, then turned back to the class and quickly recognized Johnny's predicament. "Yes, Johnny, you may be excused."

Johnny's hand dropped slowly and he settled back in his seat, crossing his legs. His bottom lip trembled and he cried, "It's too late now!"

The sense of urgency that caused Johnny's accident has gripped most of us at one time or another with equally embarrassing results. Urgency starts our adrenalin pumps going full blast, nature's way of priming us for immediate emergency action. The trouble comes when we allow this sudden infusion of energy production to overrule our thinking apparatus. If Johnny had thought, he could have rushed to the front of the room, attracted his teacher's attention with a whisper and been on his way to a suitable site to cope with his emergency.

Johnny's accident can be quickly cured and soon forgotten. Unfortunately, the same does not always apply when a sense of urgency occurs in flight situations. Consider the following accident:

A grass fire was started at approximately 1930 at a field site approximately 400 feet from where a unit was bivouacked. A moderate wind, with occasional gusts, was blowing the fire toward parked aircraft. Crews were alerted to move their aircraft.



"a sense of URGENCY"

We must use our brain as overspeed governors to prevent runaway and illogical reactions to that sudden shot of adrenalin which produces a sense of urgency

An AH-1G copilot untied the main rotor blade and the pilot started the engine and took off, with an inoperative searchlight and no landing light. He had no visual ground reference and climbed out on a heading of approximately 300 degrees to an altitude of about 500 feet. He flew for approximately 2 to 3 miles, then turned back, intending to land with the grass fire as a ground reference. A slow, shallow approach was attempted because he had no lights. The helicopter hit the ground in a level attitude, collapsing the skids, and rolled on its right side. When the main rotor blade struck the ground, the hub separated from the mast and the other blade struck the vertical stabilizer of the tail boom, severing the 90-degree gearbox with the tail rotor attached.

Flight surgeon: ". . . The pilot, arriving at the aircraft first, jumped into the rear and began an abbreviated preflight as he turned on the fuel, battery, radio, engine and power, but did not perform a complete runup. Since he is usually aircraft commander and seated in front, his own helmet and gloves were still in the front seat. He put on the copilot's helmet and did not use flight gloves or fasten the shoulder harness.

"The copilot entered the front seat and put on the pilot's helmet. He secured his own seat belt, shoulder harness and flight gloves. Both wore fatigues and flight jackets, but neither was wearing fire retardant clothing at the time.

"Approximately 5 minutes elapsed from the time the fire broke out until the aircraft was airborne. During this time, both the pilot and copilot were exposed to the bright glare of the 10-foot flames of the fire. Neither sustained significant smoke, heat or eye irritation. As they took off, the pilot reached for the searchlight, then recalled that the aircraft was 'circle red X' from night flight because the searchlight was inoperative. Only the light of the flames and momentary taillight of the aircraft circling above were visible. There was no visible horizon and no visible trees, shadows, ground, ground lights or vehicles.

"They flew strictly by instruments and were alternately focusing between instruments and the sky. Attempting to further regain their night vision, they flew away from the flames for about 2 miles, then circled to the right, making a 180-degree turn toward the fire in hopes of using its light shadow to land short of the fire in the field. The last altimeter reading was 1,100 feet indicated (approximately 300 feet absolute). They slowed to about 10 knots, decreased collective, reduced power and made a slow descent. Neither man gained visual reference to the ground or horizon except for the fire in front of them. Both felt they were flying horizontal to the ground, but higher than they actually were.

"Suddenly, there was an impact and the aircraft rolled over on its right side. . . . No apparent injury or excessive decelerative forces were noted despite the failure of the pilot to use his shoulder harness. The plexiglas was only slightly cracked on the rear window, so the pilot freed himself from the aircraft by breaking the plexiglas with the breakout knife located on the rear instrument panel in front of him. After handing the knife to the copilot, he crawled out, scraping his helmet on the plexiglas and yellow escape bar and sustaining minor lacerations on the fingers of his right hand.

"The copilot in the front gunner's seat apparently pulled the jettison handle without first rotating the door handle up to unlatch it, and he was unable to jettison the door (postcrash investigation revealed the escape door to dislodge easily when opened from the outside). He then cut the plexiglas window and crawled out, without injury.

"The engine and fuel switches were shut down

and the two began walking toward the base camp fire. . . .

"Summary: Several factors relating to disorientation and illusions were of primary importance in this accident:

"1. They failed to establish a good degree of night visual acuity prior to takeoff and lost a portion of what they did regain when they flew back toward the flames.

"2. They flew and attempted to land without visual reference points.

"3. They undoubtedly experienced some degree of the autokinetic phenomenon when their eyes were fixed on the solitary light of the flames viewed against a dark background.

"4. The inoperability of the searchlight further limited their visibility and orientation while attempting to land.

"Other important factors relating to the accident include:

"1. Confusion and an apparent emergency need for the aircraft to be relocated helped create a situation calling for a high degree of training, experience, judgment and instinct.

"2. There was a hasty and probably incomplete preflight performed.

"3. The pilot failed to use flight gloves and shoulder harness— the lack of gloves probably accounting for the only injury in the accident, that of minor cuts on his fingers while evacuating the aircraft.

"4. Both failed to wear fire retardant clothing while flying.

"5. Both failed to wear their own personally fitted helmets.

"6. The copilot, in the front gunner seat, failed to rotate the emergency door handle prior to pulling the jettison handle, necessitating the use of the breakout knife to escape through the plexiglas."

Investigation board findings: "Pilot became disoriented while landing to an unlighted field and flew the aircraft into the ground. . . .

"Pilot exercised poor judgment by attempting a landing at night to an unlighted area without a landing light. . . .

"Due to the apparent emergency situation, a sense of urgency existed throughout the flight, causing undue haste during all procedures. . . ."

Reviewing official: ". . . A major contributing factor was supervisory error. The unit's tactical SOP did not cover the procedures for emergency evacuation of aircraft, nor were crews properly briefed on these procedures during the training exercise. . . . Emphasis on the techniques and hazards of night flying will be stressed at this installation. Newly assigned aviators will be thoroughly briefed on these techniques and hazards upon their arrival. Local regulation has been changed, requiring aviation unit commanders to ensure that all assigned aviators are proficient in minimum light operation prior to field training exercises. Aviation units have been directed to include the procedures for emergency evacuation of aircraft in their tactical SOP."

Remember Johnny? His sense of urgency, though far less serious in consequence, produced an accident because he let his physical reaction overcome his thought processes. The two aviators in this Cobra evidenced physical reactions in their apparent urgency to get back on the ground. You see, the real clincher in this accident came in the last sentence of the board's findings: "There was a lighted runway, with GCA and ADF approaches, 7½ miles from the crash site."

While we must all be thankful for nature's sudden energy when we face emergencies, we must also keep our mental computers active to select the most logical action. We must use our brains as overspeed governors to prevent runaway and illogical reactions to that sudden shot of adrenalin which produces a sense of urgency.

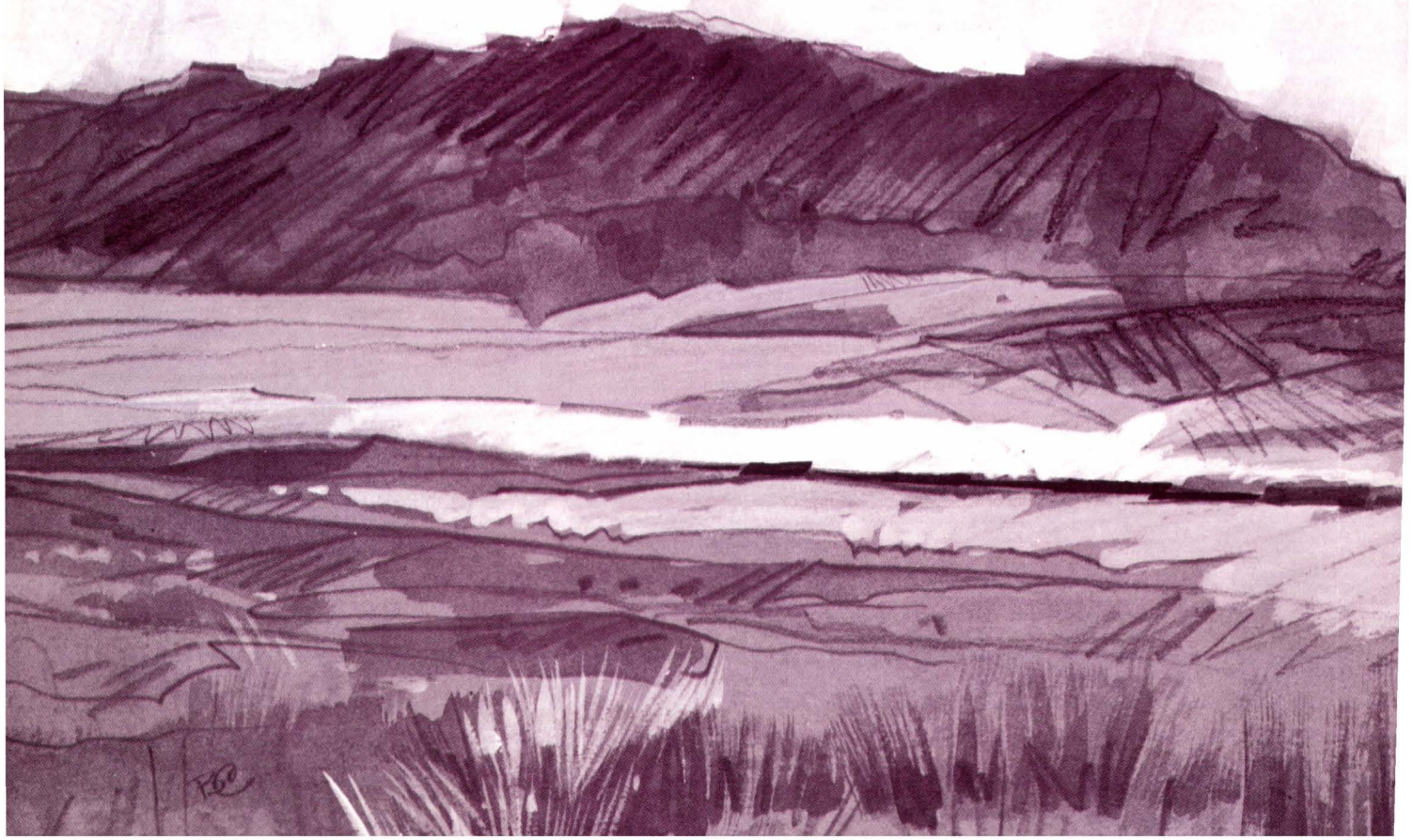
ARMY AVIATION UNITS experienced nearly 2,300 noncombat aircraft accidents during fiscal years 1966 through 1968. Over 900 lives were lost and more than 2,000 personnel were injured. Estimated dollar losses can be equated to the cost of equipping, training and deploying 17 airmobile companies. The loss of combat effectiveness caused by the loss of lives and equipment will never be determined.

The Weekly Summary published by the United States Army Board for Aviation Accident Research (USABAAR) for the period 21-28 November 1969 showed that errors by aircraft crew members and maintenance personnel were responsible for more than 55 percent of all the aircraft accidents that occurred during fiscal year 1969.

An analysis of the UH-1/AH-1G mishaps that were reported to USABAAR by crash facts messages during the week 29 November-5 December 1969 has been conducted. A review of that week's Weekly Summary will show why our initial question was, "Did black Monday last all week?" The loss of lives and aircraft during that week was cause for alarm. UH-1/AH-1G mishaps caused nine fatalities and seven injuries. Eight aircraft were classified as total losses. Personnel error (aircrew, maintenance and others not assigned to aviation operational and main-

PROFESSIONALISM

Since the majority of Army aviation mishaps are the result of substandard performance of individuals, everyone in Army aviation must be made to realize they have to be professional in their day-to-day operation . . .



Lieutenant Colonel Loren C. Strange

Aircraft Accident Review and Analysis Department
USABAAR

tenance units) was assessed as the cause factor in 24 mishaps.

Since the majority of Army aviation mishaps are the result of substandard performance of individuals, it is apparent to me that commanders of Army aviation operational and maintenance units, as well as everyone in the accident prevention chain of command, must devote considerable attention to personnel to eliminate mishaps caused by insufficient training, lack of standardization in accomplishing flight maneuvers, errors caused by maintenance personnel deviating from applicable repair manuals, inadequate supervision and breach of discipline.

Following are examples of mishaps that occurred during the week of 29 November-5 December 1969. Readers are cautioned that my analysis of these mishaps was accomplished by using the information submitted to USABAAR by crash facts messages. Preliminary information contained in crash facts messages is subject to change once the mishap has been properly investigated and analyzed, using all

The mishaps referred to in this article are the type experienced by assault helicopter companies on a recurring basis. Analyses of accidents almost invariably reveal errors in judgment, unnecessary departures from good habits and deviations from established safe practices

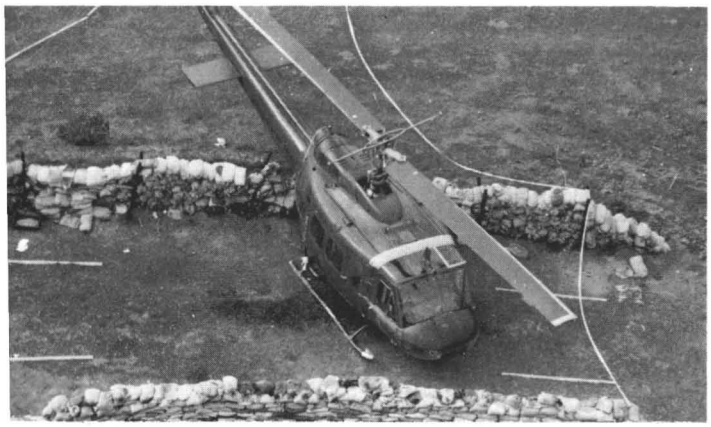
Good judgment concerning fuel management is important to mission accomplishment

While maintenance malpractices are sometimes not readily apparent, these people are not immune to errors in judgment, discipline and professionalism

information concerning the man, machine, mission and environment.

A UH-1H was destroyed, read one message, when the "Aircraft went IFR and crashed on side of mountain." There were three fatalities and one person was classified as missing in action. It is recognized that mission requirements and shortage of personnel (including instrument examiners) frequently prevent unit commanders from conducting extensive instrument qualification programs. This does not, however, prevent aviators from practicing hooded flight on administrative flights. Professionalism demands that aviators make maximum use of each flight to improve their proficiency. Survival demands that aviators constantly evaluate deteriorating weather conditions and know their limitations regarding instrument flight.

Incident damage to the synchronized elevator of a UH-1D occurred when the pilot was picking the helicopter up to a hover in a revetment. The tail drifted to the right and the elevator brushed the side of the revetment. An instructor pilot was aboard. Increased alertness and effective crew coordination might have prevented this and the other revetment strike mishap that occurred that week.

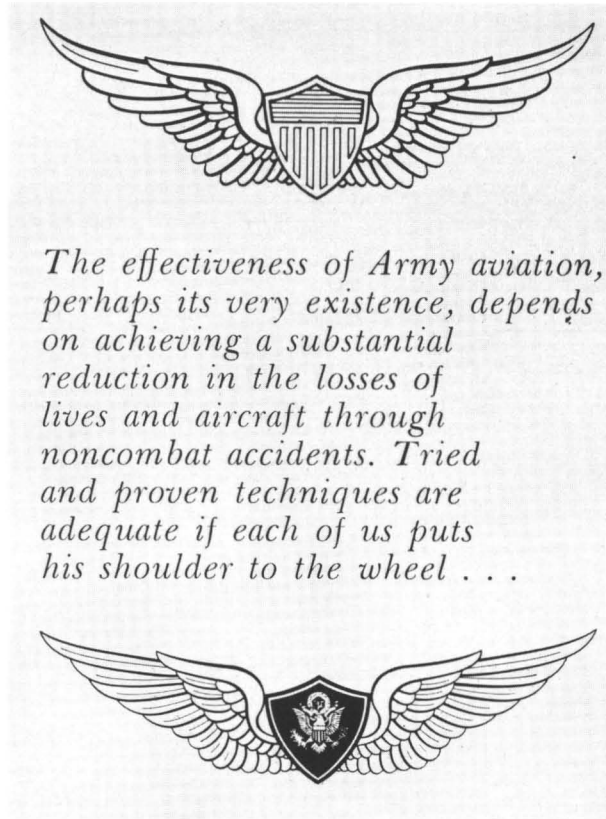


Revetment strikes can be eliminated by increased alertness and effective crew coordination

A precautionary landing was necessitated by the aircraft commander of an AH-1G staying on station in contact area too long, resulting in his Huey-Cobra running low on fuel. While mission accomplishment is mandatory, the use of good judgment concerning fuel management is equally important.

The crew of an AH-1G was departing on a combat assault mission. "The pilot entered a cyclic climb. At approximately 1,000 feet above ground level (AGL) his airspeed approached zero and he was running out of left pedal. He nosed the aircraft over and, as the nose started to the right, he moved the cyclic to the right to follow aircraft movement. At this point, the aircraft rolled to the right and nosed over in a sharp descent. The pilot was unable to gain control prior to passing through 500 feet AGL. The aircraft was finally leveled at 10 feet, at which time it fell through, impacted the ground hard, bounced back into the air, spun to the right, impacted again and rolled on its right side." Major damage resulted to all components. The pilot escaped with minor bruises, sustained while exiting. The copilot sustained cracked vertebrae from impact. Both are considered to have been extremely lucky.

Analysis of this mishap indicates the pilot elected to accomplish flight at or below zero g. AH-1G operators were advised by a safety-of-flight change to the operator's manual, change 4, TM 55-1520-221-10, dated 8 August 1969: "At moderate to high airspeeds, it becomes increasingly easier to approach zero or negative load factors by abrupt forward cyclic inputs. The AH-1 may exhibit a tendency to roll to the right simultaneously with the forward cyclic input," especially when the roll channel of the stability augmentation system (SAS) is disengaged. Operators were warned: "The right roll occurs throughout the normal operating airspeed range and becomes more violent at progressively lower load factors." Recovery techniques required to effect recovery if an abrupt right roll should occur when lowering the nose rapidly were outlined in this publication. The rotor system must be loaded



before recovery can be effected. Therefore, the aviator is required to pull in aft cyclic to stop the rate as left lateral cyclic will not effect recovery from a well developed right roll during flight at less than one g. Aviators must review the flight maneuver techniques and comply with restrictions outlined in the operator's manual if mishaps like this one are to be eliminated.

The American soldier is well trained in airmobile operations. He receives at least an orientation of safety precautions necessary around helicopters during basic or advanced individual training. Most aviation units conduct briefings for their supported units on a recurring basis. This being true, it is hard to understand why helicopters continue to be damaged when, as often reported, "A jeep with tall antenna drove under turning rotor blades, damaging main rotor blades." Military personnel of other nations may not have received training with helicopters. Therefore, aircraft commanders must ensure that control measures are taken that will prevent mishaps like the following: "A [foreign] soldier, carrying a PRC-25 radio with long antenna on his back, walked under the main rotor blades. The aircraft commander did not see him until a blade struck the antenna."

Aviators are not the only group whose errors or omissions result in mishaps. Personal experience, gained while commanding a medium helicopter company and later serving as executive officer of a Transportation Corps aircraft maintenance and supply battalion, proved that maintenance technicians and repairmen are not immune to errors in judgment, discipline and professionalism.

A review of the Weekly Summary will normally indicate that materiel malfunctions or failures are the second greatest cause of Army aviation mishaps. Mishaps caused by maintenance errors are not so readily apparent. It is often impossible to determine whether maintenance malpractices contributed to the failure or malfunction of a helicopter component. It is suspected that a number of mishaps classified as materiel malfunction/failure should be changed to maintenance personnel error.

An AH-1G aircraft commander was required to manually control engine rpm and make a running landing when he found his collective was frozen at 32 pounds of torque, as he started a descent. He landed with no damage. Maintenance personnel found the collective collet extension binding. This was corrected by retorquing the collet.

Failure to adhere to prescribed torque limits frequently causes precautionary and forced landings. A UH-1H crew assigned to a maintenance unit and flying a unit aircraft saw the master caution light come on and transmission oil pressure gauge go to zero during straight and level flight. Investigation disclosed that overtorquing the internal filter gasket caused the filter assembly to fail.

A UH-1C aircraft commander felt a high frequency vibration in the pedals enroute to an LZ. When he reduced pitch to descend he found it difficult to push the right pedal in. After going through the emergency procedures for hydraulic failure and

finding that nothing worked, he returned to the airfield and made a precautionary landing. Inspection of the tail rotor servo assembly revealed the washers were improperly stacked.

Personnel who have been reading the Weekly Summary and the Monthly Maintenance Summary for the past 6 months are no doubt tired of the constant reminder to UH-1/AH-1G aircraft maintenance repairmen to be on the lookout for ways to eliminate mishaps caused by malfunction of the hydraulic system. These accident prevention warning notes are evidently not receiving emphasis by supervisory personnel, as USABAAR continues to receive reports of forced and precautionary landings due to hydraulic failures.

A UH-1H crew made a successful forced landing after a hydraulic failure. It was determined that a line failed. The unit aviation safety officer did not materially assist the Army's aircraft accident prevention program, as he failed to report complete information concerning the line that failed in the crash facts message. Maintenance personnel evidently elected not to report the failure of the line to the UH-1 Systems Engineering Directorate, AVSCOM, by submitting an Equipment Improvement Recommendation (EIR). Thus, UH-1 maintainability, reliability and safety were affected by personnel error in not submitting crash facts messages and EIR reports in accordance with AR 385-40 and TM 38-750.

The mishaps referred to in this article are, unfortunately, the type experienced by assault helicopter companies on a recurring basis. All too frequently we, especially those of us assigned to USABAAR, state that we must intensify our efforts and find new and more positive methods and techniques if we are to achieve further reductions in the loss of Army aviation resources through preventable accidents. While I generally agree with this, I sincerely believe that Army aviators, aircraft repairmen, in fact, everyone in Army aviation, must be made to realize they must become professional in their day-to-day operations in this day of the short dollar. Mishaps like the ones in this article can and must be eliminated.

Colonel Eugene B. Conrad, director, USABAAR, in a recent address at a U. S. Air Force helicopter accident prevention conference, stated: "Analyses of accidents almost invariably reveal errors in judgment, unnecessary departures from good habits and deviations from established safe practices."

Inadequate command and control, including lack of supervision by flight leaders and maintenance supervisors, also contributes to entirely too many mishaps. Through training (including periodic standardization flight examinations) improved discipline on the part of everyone associated with the Army aviation program (i.e., become truly professional) and constant command supervision, we can prevent many mishaps.

I believe that we *can* realize further reduction in our present aircraft accident rate by making a belated 1970 New Year's resolution to intensify our accident prevention efforts through adherence to existing accident prevention directives (i.e., operational directives); frequent analyses of our own performance; and helping our fellowmen by making on-the-spot corrections when we see Army aviation personnel exhibiting unprofessional traits and failing to demonstrate individual discipline. The effectiveness of Army aviation, perhaps its very existence, depends on achieving a substantial reduction in the losses of lives and aircraft through noncombat accidents. Improved management techniques are not needed to eliminate most of the aviation mishaps caused by personnel. Tried and proven techniques are adequate if each of us puts his shoulder to the wheel and does his best.

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

"No Survival Equipment Necessary"

Major Alfred G. Borth, MSC

Life Support Sciences Department
USABAAR

AN ACCIDENT REPORT came across my desk the other day in which the statement was made, "No survival equipment was necessary, for the flight was to be less than an hour long." The airplane was a U-8 with a cruise speed of approximately 150 knots. The mission was a roundrobin passenger pickup. To me this would indicate the airplane would travel about 50 to 60 miles from home station before the turnaround.

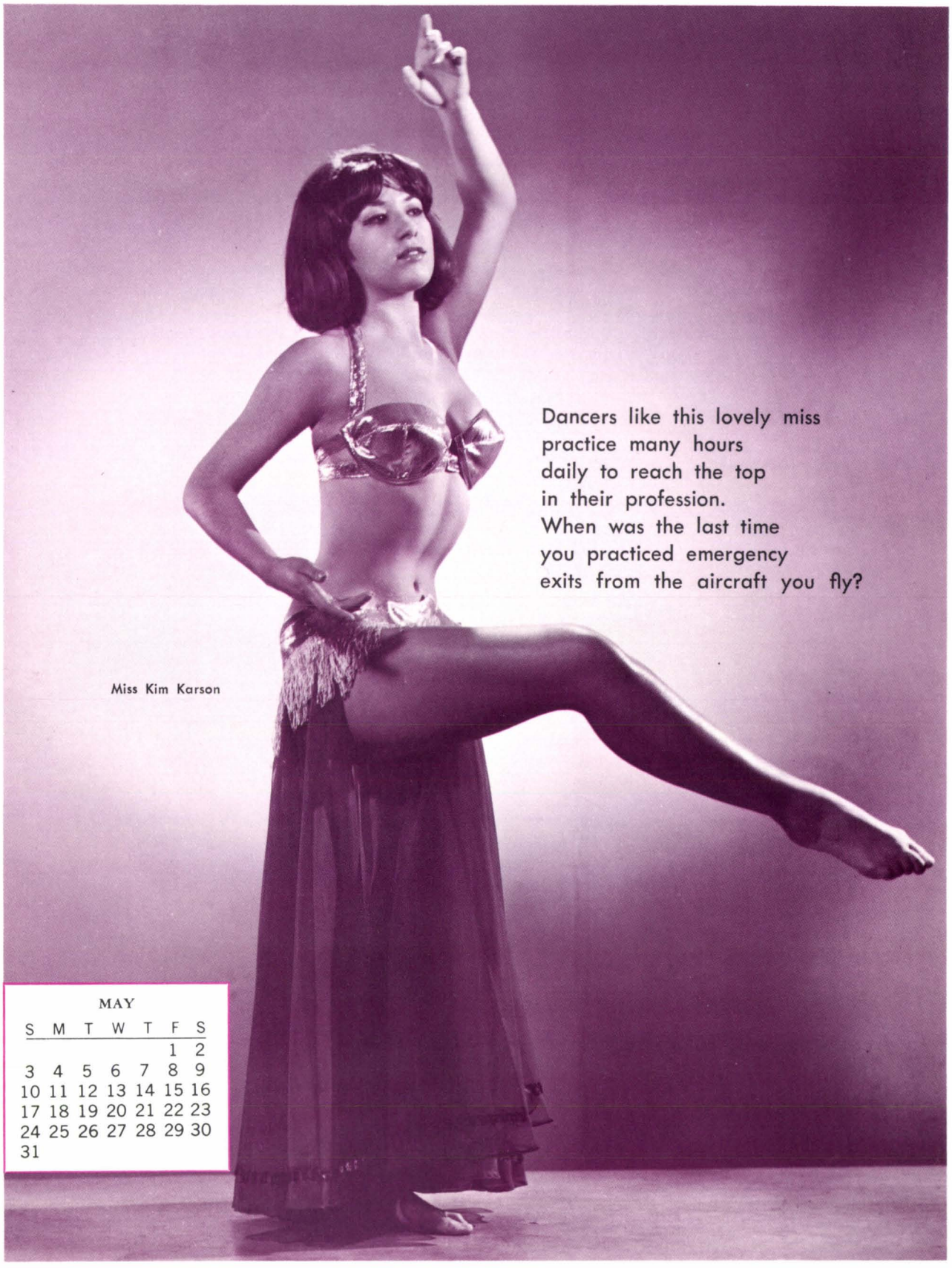
The inevitable happened, but the personnel on board were lucky. There was no survival situation in this accident. However, I have yet to draw a 50- to 60-mile radius of action around any Army post and not foresee a survival situation possibility. How about you? Have you even given survival a thought recently? I do not direct this question to pilots in RVN. I'm talking to you, the complacent stateside pilot who, armed with a wealth of knowledge, a flight suit, boots, APH-5 and gloves, goes out to fly with no forethought or preparation for survival. Look around and notice what conditions you are flying in right now. There's still cold and snow here in the states and most of Europe, as well as other areas. Are you prepared to spend one night or several nights in your bird, hoping someone will find that little speck before you suffer frostbite or freeze?

Are you the type of pilot who doesn't carry an RON kit of any sort when he goes on a local flight; doesn't carry matches or a lighter because he doesn't smoke; and doesn't carry a knife? I can hear your cries now, saying, "We can't get survival equipment!" I'm well aware of the situation in the field because I have been there. But, really now, how about you? What are you doing to ensure your own survival and rescue if you have a forced landing out in the boondocks? Most survival situations can be overcome with a little preparation and the simple addition of some signaling devices carried on your person.

Your preparation can start with reading two or more good books. First are the dash 10s for the aircraft you normally fly. The age-old adage about an ounce of prevention being worth a pound of cure is still very applicable, especially in aviation. If by-the-book emergency procedures don't work and get you home safely, the second good book comes into play—FM 21-76 Survival!

Survival with the equipment you normally carry aboard your aircraft could be pretty difficult, if not impossible. But wait. Why open yourself to a survival situation? You filed a flight plan and gave position reports if the flight was over an hour long, or 200 miles. So, at least the people at base operations have an idea of where to start looking for you. The entire search and rescue chain of events is set in motion when you are overdue. When search and rescue aircraft begin looking for you, it sure would help if you were able to signal them. USABAAR files contain several cases where it is believed the personnel died after a few days, *only because they*

CUT ALONG LINE AND DISPLAY IN PROMINENT PLACE



had no signal devices or could not be found. If you are injured, the difference between life and death may be measured in hours instead of days.

How much of a problem or expense is it to carry a nonbreakable mirror in your pocket and know how to use it? Notice I said *in your pocket.* When you exit a crashed or burning aircraft, how much time will you have to recover equipment stowed in places other than on your person?

The following items could make the difference between spending a cold miserable night or nights in an aircraft, or at home in a nice warm bed. These items, a good start toward your rescue/survival, are all available through supply channels.

ITEM AND FSN	AUTHORITY
Signal kit, personnel distress	
1370-926-9387	CTA 50-901
Knife, pocket, one 3¾ inches long cutting blade, opening device	SB 700-50
7340-163-2541	CTA 50-901
Knife, hunting, 5-inch blade	
7340-098-4327	SB 700-50

Make sure SB 700-50 supersedes one of the TAs listed in your TOE or TDA.

The one item which you may have to buy is the emergency signaling mirror, which can be purchased through most hunting and fishing stores, or through a Boy Scouts of America equipment supplier. There is one in military channels listed in SB 700-20 and available to you, if it is authorized by your TOE, so check this out: Mirror, emergency signaling, FSN 6350-923-7451.

You can also make some waterproof matches by dipping the tips in paraffin, or carry a lighter even if you don't smoke. Remember to keep it filled. Last, but not least, a small flashlight would be of great value.

If you experience delays in getting the above listed items through normal supply channels, they can be purchased for less than $10. The question you have to answer is how much is your hide worth to you.

Now you have it. Let's hope you know how to use the equipment which you bought or acquired through normal supply channels. Complacency in proper planning can be just as deadly as complacency in the cockpit. Plan for your rescue so you don't appear in an accident report as, *"Survived the crash but perished due to lack of rescue/survival equipment."*

Yes, Virginia, there is a Harry Flare! In the December issue we printed a letter from Captain Harry Flare and cast some doubt upon his existence. Then the following letter was received:

Dear Pearl:

In reference to Pearl's Personal Equipment and Rescue/Survival Lowdown, December 1969, let me assure you that I do exist.

I have hundreds of service and social security numbers and I hold all duty positions. Check your 759s closely and you will find it was me who last year logged a few thousand hours weather with unreliable or inoperative NAV and radio equipment. Another look will reveal the hours I have flown W.F.G. (without flight gear, i.e., in fatigues, field jackets, class A's, etc.) because a senior officer wanted me to look like a "real soldier."

Surely Pearl, you remember I'm the aviator who was "directed" to break my minimums, fly beyond my judgment or beyond the capabilities of my aircraft because the colonel wanted to prove that I could do it. I've only had a few accidents so I consider that pretty lucky but I'm still reaping the "rewards" of those few times I refused.

I'm also the one who believes in Army aviation. I preach professionalism both in attitude and performance. I have just graduated from the kindergarten of airmobility and my future holds a fantastic challenge. Improvements in design of aircraft and flight gear, coupled with the refinement of technique and deployment, will make my job easier and more effective. That's why I become so enraged when the nonrated and uninformed try to retard my growth. Give me the equipment, give me the mission and I'll accomplish it as efficiently, expeditiously and safely as possible.

If you believe—I exist! So keep the faith because Army aviation needs you.

Yes, Pearl, Major H. Z. Frozzleforth, Charlie Checklist and Captain Harry Flare really do exist.

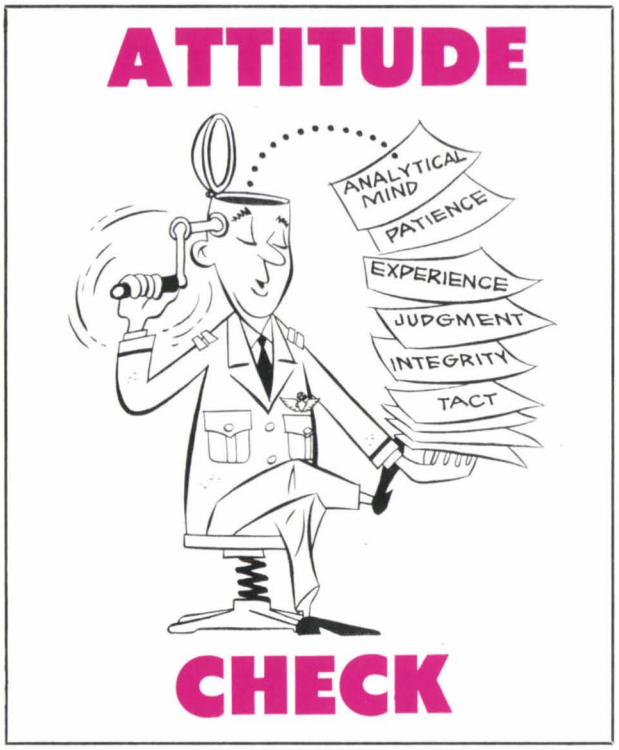
CPT Harry Flare
15th Avn Group (Combat)

As I was saying to Charlie Checklist just the other day, you're my kind of guy, Harry. I'd be glad to receive more letters from you any time.

Pearl

CW3 Lloyd N. Washer

Education and Prevention Department
USABAAR



A CRY OF "Attitude Check!" will bring different responses from different groups. A thumbs-down raspberry is one possibility. A merry "I'll drink to that!" is another. One thing is for sure. We all have attitudes and they affect everything we do, especially safety.

The Book of Knowledge of 1918 has this to say about attitude: "Presence of mind is the most necessary quality for one who wishes to fly. If only the aviator does not become frightened, an accident rarely happens." Presence of mind is part of attitude. If you are calmly alert, prepared for any emergency and cool in the face of emergency, you have a safe, professional attitude toward flying. The importance of attitude in aviation safety was known 50 years ago. As our aviation technology advanced, the demand for "presence of mind," attitude and professionalism kept pace. Today's aviator must have a correct mental attitude. It is the key to aviation safety.

One step toward an attitude leading to safety is to keep an open mind. You never stop learning in aviation. When you stop learning, you will soon be dead. Listen to everyone, not just your flight class buddies. Students will learn from old pros and old pros will learn from brand new aviators. After all, the latest flight school graduate has minimum experience, but maximum recent exposure to correct techniques and procedures. If you get into a stiff disagreement at the bar, ask around and find out what others think. Remember that a dash 10 or regulation should be consulted the following morning. Remember also to make every flight a learning situation and aviation will be a continuing challenge.

Be confident! Probably the safest thing you can do is be 100 percent confident. Keep telling yourself, "I am 100 percent sure that I am the worst pilot in the outfit." That's right, you're the worst! Fortunately, however, you learn quickly and continuously. This will allow you to always measure your capabilities and the aircraft's capabilities against the mission. You will not have to stick your neck out to prove that you are good, better or best. Since you are the worst pilot in the outfit, all you have to accomplish is the mission, without breaking the machinery in the process. Everyone, including yourself, will think you are doing very well, considering your ability.

Another important thing to remember is that you forget. If you think you can perform a maneuver as well now as you could when you did it every day in school, you are in big trouble. We all forget. No one retains all that he learns. Forgetting is called lack of proficiency in our business. When you develop an attitude that causes you to practice and repractice, you will be *called* proficient, but you will be *safe*.

During a recent USABAAR presentation, it was pointed out that the Army's aircraft accident rate has remained relatively unchanged for the last 3 years. The obvious major steps in accident prevention and aircraft improvements have all been made. Left now are the difficult steps only and *only* these will improve the accident picture. It's not true. Each and every aviator can think safe. We can all improve our attitude about safety. An easy and huge improvement can be made right now. Everyone —aviator, crew chief, mechanic—can think, act and live safe.

MANY ARTICLES have been written and many bull sessions have been held by pilots about *aviation* safety. The smart ones learn by their mistakes and the mistakes of others and become safer, more professional pilots. This concept applies not only to those who fly, but to all who *drive ground vehicles*. With the training pilots receive, they should be well aware of the safety rules, many of which are only common sense. Most pilots don't just fly—they also drive automobiles, motorcycles, trucks, etc. The ones who are injured or killed in ground accidents are just as lost to combat resources as the ones injured or killed in aircraft accidents.

As a helicopter instructor pilot, I emphasized to my students that as soon as the sun disappeared behind the horizon, our lights went on and we were logging "N." The lights were on for an obvious reason—TO BE SEEN! I wanted the whole world to see me. This is precisely the point I am making.

Uncle Sam has quite an investment in you by the time you have several years of flying under your belt. No doubt you are safety conscious while flying and take every precaution, even to the point of defensive flying. You wouldn't consider flying after sunset without turning on your navigation lights. Yet, there seems to be a great reluctance to turn on automobile headlights when the sun goes down. The reason probably will never be known without the aid of a couch.

A rated pilot nearly caused what could have been my last roundrobin to the grocery store. No, I didn't fly—I drove. The first leg was uneventful, but on the trip home I was nearly clobbered. The sun had gone down, but it wasn't quite dark. Night flying was in progress at the nearby base. By the number of airborne lights I saw, someone must have been behind schedule.

I was approaching a major intersection at about 8 knots with three cartons of milk on the seat beside me. The "YIELD" sign told me to slow down, look and turn with caution. I *did* look—both ways. I had just started my turn when I heard the squeal of tires and a horn that sounded as if it was in my right ear. I saw the blurred outline of a dark, fast moving car flash by me without lights. I slammed on my brakes and the milk cartons were catapulated to the floor.

First, I was terrified. Then I blew my cool. I made a 180 to catch the so-and-so and give him a piece of my mind. It took several minutes to follow him home. This gave me time to cool off considerably. We both pulled up to the curb, stopped and got out of our cars. I lucked out by cooling off because he was big. The flight suit made him look even bigger. I told him that I was the guy at the intersection that he almost hit, even though I looked carefully before pulling out.

His answer was, "No sweat, I saw your headlights in time to miss you."

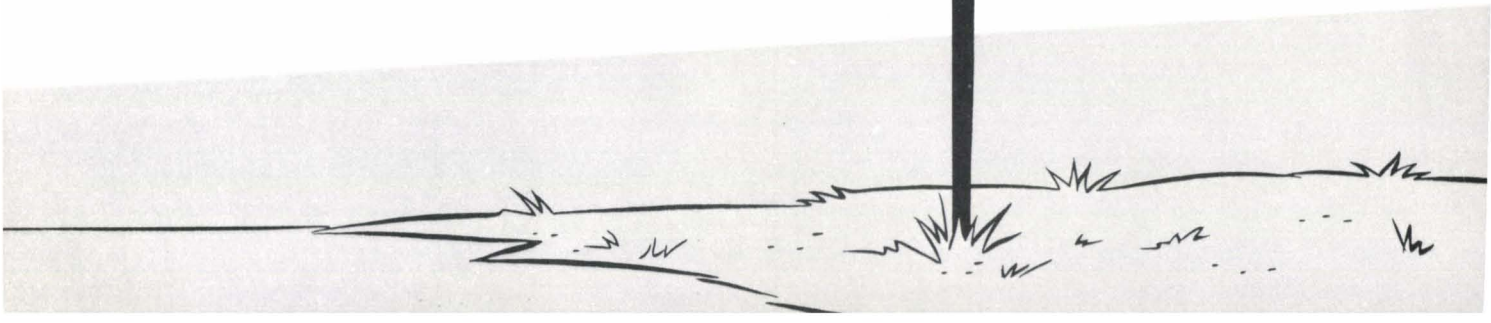
I explained that I did not see him because, without headlights, he blended into the background. He said, "I could still see. No use wasting the headlights, since it wasn't dark. But I guess I could have turned on my parking lights."

SEE AND BE SEEN

Aviation personnel who are injured or killed in ground accidents are just as lost to combat resources as those injured or killed in aircraft accidents

Laurel D. Sand

Life Support Sciences Department
USABAAR



Some compromise! He wasn't parked when he almost hit me. Suddenly, he saw the light (no pun intended). He said, "We almost had a wreck that would have been my fault. You didn't see me, but I saw your headlights in time to miss you." He offered his hand and said, "I'm sorry."

Maybe the apology was all the satisfaction I needed, especially from such a big fellow. I wasn't angry anymore—just puzzled. On the way home, I saw several other cars driving without lights, though it was nearly dark. Why? It's important to see, but it's probably more important to be seen. This is a *must* in defensive driving.

In 30 years of driving, some of it professional, I've tried to learn as much about driving as I did about flying and, by analyzing my mistakes, become a better driver. Headlights seldom wear out from use. It is entirely possible to have the original headlight unit in a 10-year-old car. The major electrical system is working continuously as long as the engine is running. The cost of using your headlights 24 hours a day for 10 years is insignificant.

Waste electricity? Cost more to drive when you use your lights? Absolutely not. The use of such a simple safety device as your headlights is far better than an accident, hospital bills, a possible lawsuit or worse.

Here are a few points you should remember:

1. Turn your headlights on during all periods of reduced visibility. Dusk and dawn are two of the most dangerous times of the day to drive.

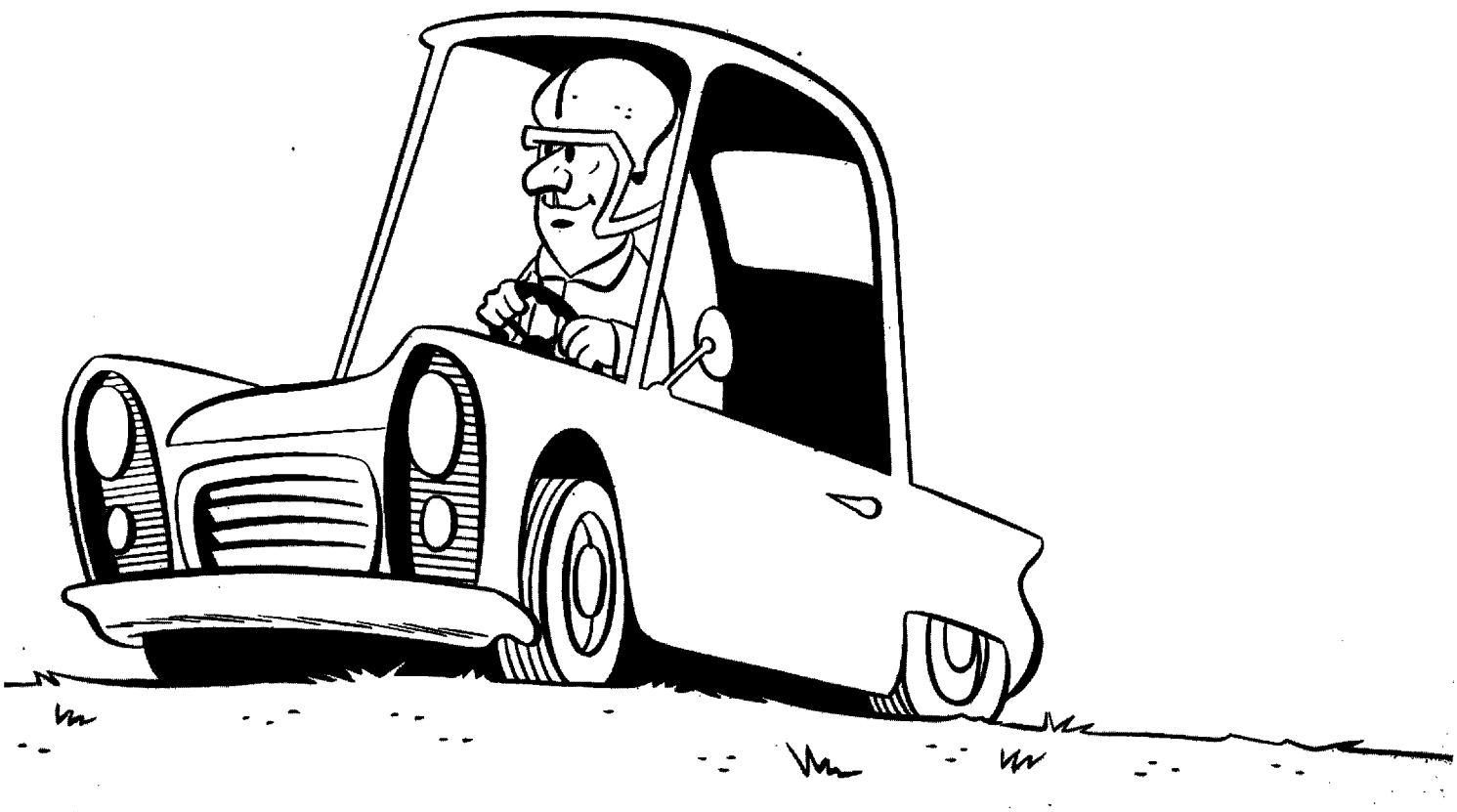
2. Do not use your parking lights while driving. In some states, this is illegal. At a distance, your approaching car may be mistaken for a parked car. If someone coming the other way should attempt to pass, it could result in a collision. Your headlights are much larger in area and brighter. They can be seen from a much greater distance and indicate your car is moving. Parking lights are of little use in rain, fog, dust or darkness.

3. You owe it to your fellowman, your family and yourself to use *all* the safety devices at your disposal.

The Port of New York authority reduced certain type traffic accidents to part of its fleet by almost 20 percent simply by using the headlights on their vehicles for all operations. The greatest improvement was in the reduction of *rear end collisions to passenger vehicles, which showed a 45-percent improvement.* It was also found that those accidents which did occur to the vehicles with their headlights on were a good deal less severe than similar accidents to unlighted vehicles.

The next time you take an extended trip or a Sunday drive on any busy highway, make it a point to watch for buses and trucks. If you haven't noticed before, you'll be surprised how many of the real pros in the driving business use their headlights all the time, regardless of visibility or weather.

You may see me driving with my headlights on any time I think visibility is reduced and you may think I'm nuts because you can see fine. If you don't have yours on, I wish you luck. You see, I'm one of several million drivers who can't see quite as well as we used to.



USAASO Sez

The U. S. Army Aeronautical Service Office discusses

Ensuring the accuracy of FLIP information

Meanings of items on instrument procedure charts

More On DOD Flight Information Publications (FLIP): In the last issue we pointed out the service that pilots can provide in detecting and reporting errors in flight information publications. This time we would like to point out steps which airfield operations personnel can take to help ensure that information on Army facilities is accurate. Each time the newest element of the FLIP is received, check to see whether it correctly (and completely) reflects the status of facilities/services at your airfield. This check should include:

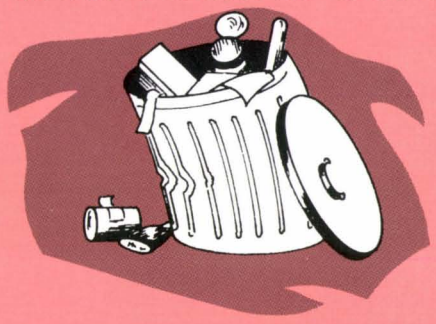
- **The IFR and/or VFR Supplements for airfield data/services/facilities/remarks (in conjunction with the aerodrome sketch publication).**
- **The enroute/area chart for correct portrayal of airfield/controlled airspace/special use airspace (in conjunction with FLIP Planning, Section II B).**
- **The instrument approach procedure and standard instrument departure publications for correct portrayal of the approach/departure procedures, the ATC services/radio frequencies and the airfield sketch.**

The charted approach procedure (or radar data in the IFR Supplement) should be checked versus the current Army instrument approach procedure document which was received from USAASO.

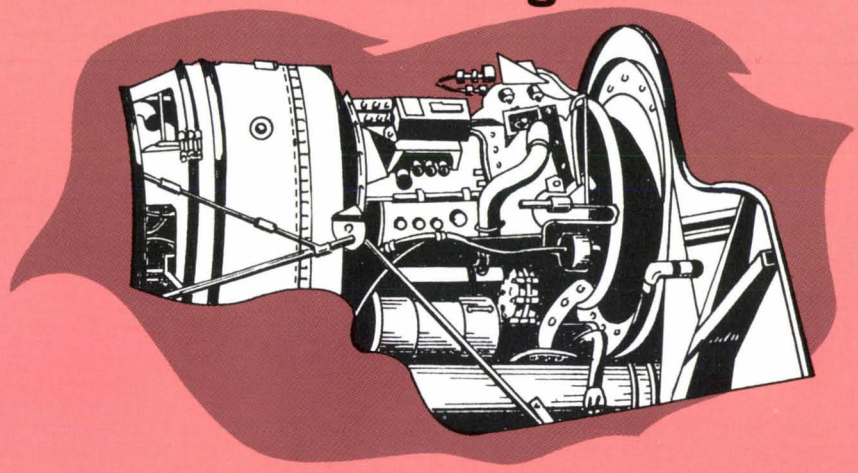
When any information item is found incorrect, send a detailed request for correction to USAASO. When a change to a terminal instrument procedure is necessary or desired, consult AR 95-9 for appropriate action. When a change to controlled airspace or special use airspace is necessary or desired, consult AR 95-50. Your Department of the Army Regional Representative (DARR) at FAA regional offices will be glad to help you with airspace and associated problems. Try him!

On Instrument Procedure Charts: Pilots often ask what the abbreviations and numbers found at the top of instrument procedure charts represent. Centered at the top of the Ft. Rucker, Ala., CAIRNS AAF Charts, you will find AL679(USAF). The AL represents Chart, Approach and Landing (AL) (Low altitude). The number represents an internal file code for the given airfield. The abbreviation or title contained in parenthesis following the AL number represents the military service, agency, government and/or airline responsible for the procedure. Many of these are self-explanatory, e.g., US Army-USAF-USSG-USN-UK-Italy-Germany-GAF (German AF)-KLM-SAS-Air France, etc. JAL identifies Jet Approach and Landing (High altitude) charts. (These High altitude titles will soon include the word "Hi" to help in ATC/pilot differentiation from Low altitude charts.) All the coded data is used for administrative purposes and should not be used to report chart errors. When doing so use the airfield name and procedure title found at the top and bottom of the chart. This readily identifies the procedure for operational or administrative purposes. For example, Greatly AAF, VOR Rwy 27 is all that is needed in field reporting for proper identification of the procedure. Certain Army procedures which have not been processed under TERPs still carry an FAA code for responsibility. These are a hangover from an older system but are being removed as procedures are revised under TERPs.

What Can A Garbage Can Do...



That An Engine Can't?



Answer—EAT FOD

LESSONS LEARNED
FROM AIRCRAFT ACCIDENTS

The Quarter Million Dollar Tip

THIS SEQUENCE of photographs depicts the in-flight breakup of a UH-1 as described in a recent television program produced by the Film/ETV Division, Director of Instruction, Ft. Rucker, Ala., in co-operation with the U. S. Army Board for Aviation Accident Research (USABAAR). The program is aimed at enlisted mechanics, but should prove of interest to all maintenance personnel. Although its use is now restricted to activities being served by video tape instruction, 16 mm motion picture copies will be available at USABAAR in the near future.