UNITED STATES ARMY

FEBRUARY 1967

AVIATION DIGEST

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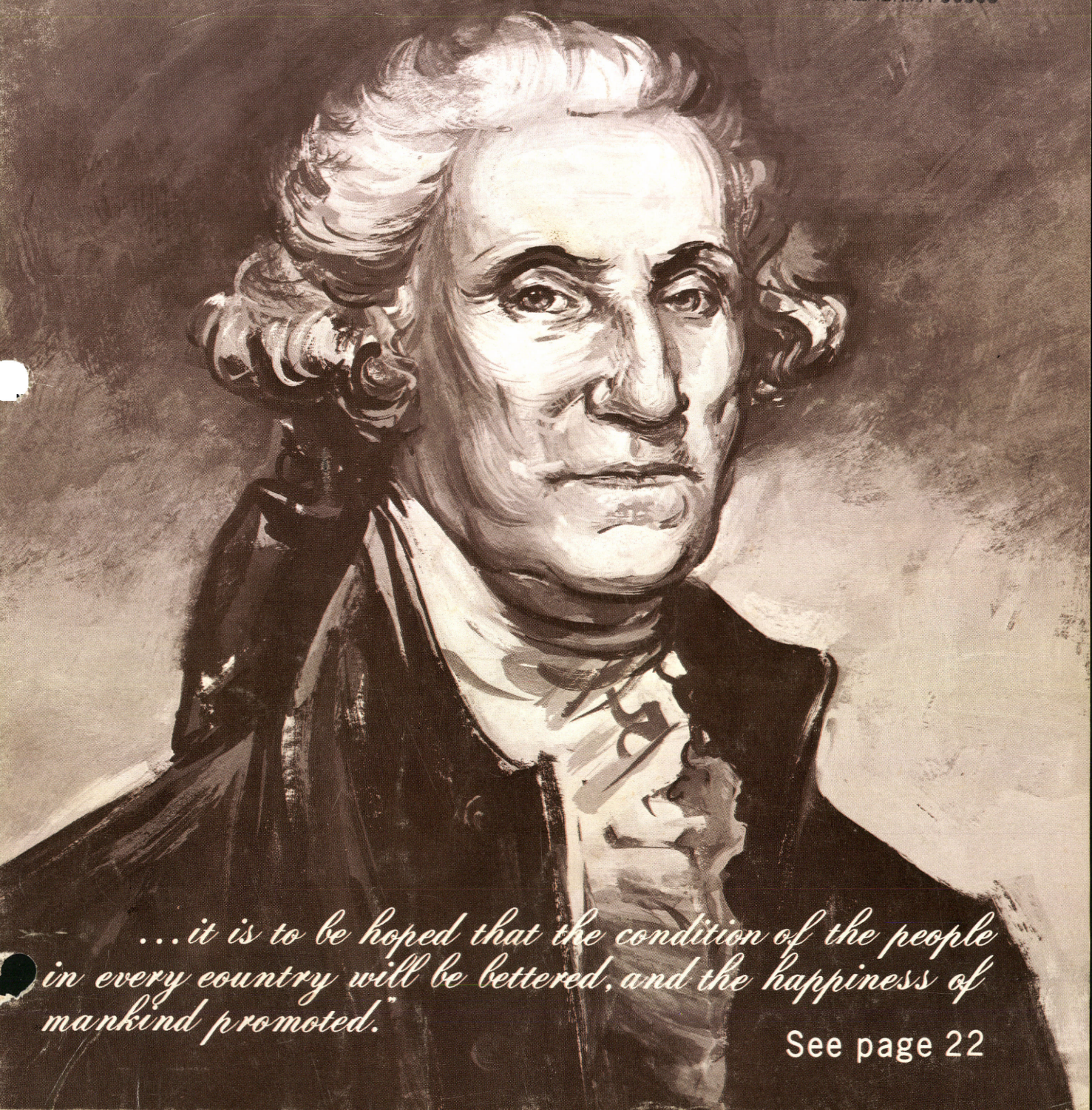

"...it is to be hoped that the condition of the people in every country will be bettered, and the happiness of mankind promoted."

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UNITED STATES ARMY AVIATION DIGEST

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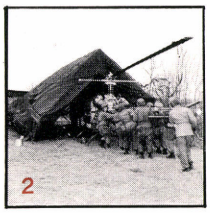

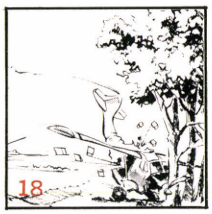

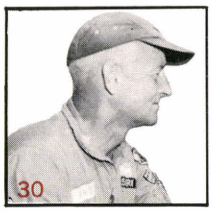

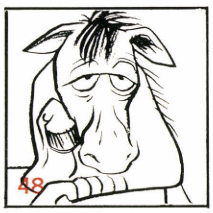

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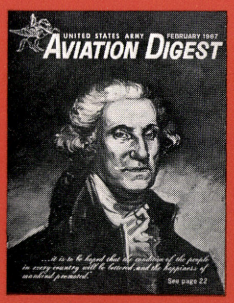

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

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Articles, photos, and items of interest on Army Aviation are invited. *Direct communication is authorized to: Editor-in-Chief, U.S. Army Aviation Digest, Fort Rucker, Alabama.*

Use of funds for printing this publication has been approved by Headquarters, Department of the Army, 29 December 1964.

Active Army units receive distribution under the pinpoint distribution system as outlined in AR 310-20 March 62, and DA Circular 310-57, 14 March 63. Complete DA Form 12-4 and send directly to AG Publications Center, 2800 Eastern Boulevard, Baltimore, Md. 21220. For any change in distribution requirements, merely initiate a revised DA Form 12-4.

National Guard and Army Reserve units submit requirements through their state adjutants general and U. S. Army Corps commanders respectively.

For those not eligible for official distribution or who desire personal copies of the DIGEST, paid subscriptions, $4.50 domestic and $5.50 overseas, are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.

LETTERS

Sir:

The recent article "Don't Be Afraid . . . Those Are Friendly Aircraft" in the September 1966 issue of the Digest was read with great interest by the members of our section, and a discussion of the article and similar situations observed by the section followed. As a result of our discussion, we would like to suggest a possible solution for problems of this type.

We suggest that a loudspeaker system be made available to the pilot or observer/passenger to provide a means of speaking directly to people on the ground. This could be accomplished either by the use of a handheld "bullhorn" type of loudspeaker . . . which is not too practical, or by fitting a loudspeaker to the aircraft which was routed through the pilot's/observer-passenger's helmet microphones and cyclic grip transmission switches. We favor the fixed loudspeaker mounted on the aircraft and routed through the helmet mikes and grip switches, as this would also provide a means of performing a variety of other missions more efficiently as well as preventing the type of incidents outlined in the article. This loudspeaker could utilize one of the channels of the standard UHF radio mounted in observation helicopters . . . possibly the intercom channel with a separate switch to switch the speaker off and on to prevent "live" transmissions to the "outside" . . . and should require no more power than is already available in the existing circuit.

Naturally, the installation of a loudspeaker of the type suggested would require judicious use, but good communications discipline would preclude the system creating more problems than it would solve.

CPT WILLIAM R. PARKER
Battalion Aviation Officer
4th Bn 36th Arty
Akron, Ohio 44310

Sir:

I have just received a copy of the November Aviation Digest with a request that I keep it in my reception room. Thank you. It is most interesting, the first I have seen, and I have enjoyed reading it.

However, it would be embarrassing to the Army, I am sure, were I to keep it in my reception room. This is a Navy town. A great proportion of my patients who would see it are well informed on military and international customs, including the use of the 24-hour clock.

They would do a double-take when they saw the expression "at 0900 hours the next morning" on page 13 in the interesting article "Mission Release." They would say, "That would be 37½ days from some reference date, unmentioned."

By now you recognize the fact that I am being a bit facetious, but having had occasion to criticize the proceedings of the Naval Institute for an identical faux pas, I feel I should do as much to another service, in all fairness to both.

When I started keeping radio logs in 1908, "hour" in such a place was de trop. Since then as amateur, commercial and navy communicator I have not seen authorization for any such use, and in communication instructions for the joint services, in two world wars in which I have been a communicator, I have seen none. I would censure a subordinate who used it.

But such errors are bound to slip by editors, copy and re-write personnel, and the news services are particularly bad offenders.

Do not let my comment disturb you unduly, any more than I was very much disturbed by the error.

I wish you and your outfit the best of luck and success. I am too old to do more than exert my every effort to try to get things changed so that our people in Vietnam may do the job they can and would like to do, to the end that they may the sooner come back to the States. That much I am doing.

CPT JOHN E. WATERS
USNR (Ret.)
402 D Avenue
Coronado, Calif.

Sir:

The need for a school in which to train Army air traffic control personnel (MOS 93B) in tactical air traffic control procedures was born with the air assault concept. With every increasing Army air power in Vietnam and elsewhere, there is a dire need for air traffic controllers who are familiar with the tactical concepts of Army air traffic control.

When we graduate PFC John Jones from a course in air traffic control he will, in all probabilities, become a crackerjack controller in a VFR tower. But let's send PFC Jones to Vietnam a year after graduation. In Vietnam, TACTICAL air traffic control is a must. Is Jones familiar with Army flight following? Can he make hasty repairs on the equipment that powers his radar or radio set? Can he conduct a TACTICAL IFR GCA approach? Is he thoroughly familiar with the capabilities and limitations of the TACTICAL air traffic control equipment that he will be using in the field?

Unfortunately, the answer in the majority of cases is no, unless PFC Jones has received extensive training in an Army air traffic company.

In addition to the excellent training Jones receives at the Air Traffic Control School in use today, he should attend an additional course of instruction in tactical air traffic control, taught in an ARMY school by ARMY instructors.

PFC Jones should receive instruction on the concepts and operation of Army aviation units. He should know how to mark and light tactical landing areas. Jones should thoroughly understand and be able to use flight progress strips. Understanding the basics of the generator that powers his equipment is a MUST. There should be a generator mechanic available where Jones will be stationed—but will there be? PFC Jones should also know the capabilities and limitations of the ARMY aircraft that will come under his control.

Training in a simulated Flight Coordination Center would enable Jones to become familiar with the latest in tactical equipment. Radar target generators would allow Jones to conduct simulated TACTICAL GCA approaches at 1, 2 and 3 miles final.

This is not meant to imply that our present method of training our Army controllers is outdated. Rather, additional training is not only desired, but is a MUST if we are to provide our modern day Army aviation with the best in tactical air traffic control service.

SFC KENNETH DOWIE
Sr. Air Traffic Controller
72nd Air Traffic Company
Ft Benning, Ga. 31905

ANNUAL AWARD
Monthly Winner
CONTEST

Better Aircraft Availability -- everybody's goal

Major Harold L. Jones

AIRCRAFT AVAILABILITY is at best a hazy term. To many people it means 90 percent or better—people tend to talk in terms of statistics and percentages whenever availability is mentioned. High percentages are well and good, but like many things today they're just so much "eyewash" in reality. What *is* important is whether or not enough safe aircraft are available to satisfy operational requirements.

If a unit with 25 assigned aircraft pushes for a month or so, using 19 or 20 aircraft every day and then gets a breathing spell where operations only needs 14 or 15 a day for a week or two, it's not logical to continue to expect 20 flyables every day, is it? Almost everyone will agree that this would be the time to get caught up on maintenance. It would be great to be able to pull eight or ten periodics and fix those two "seeping" rotor heads, wouldn't it? Sure it would. Then most of the aircraft would be ready for the next sustained push. All too often, though, maintenance is expected to keep up that magic figure of 22 or 23 out of 25. When operations calls in these statistics to the battalion operations center you can guess what happens:

"How about two more ships, Joe?"

"We've got 'em, but we need to keep a few down for a little deferred maintenance, Mac. And besides, my pilots and crews need a rest."

"I hate to tell you this, Joe, but the Three just handed me a note. I'll quote: 'Get four more ships from Joe. One of the other companies is short today.' "

So what happens? You're still committed for 19 and maintenance misses another chance to catch up some. Instead, they continue to push at max effort and hope they'll be able to continue to produce the magic 90 percent plus.

It all boils down to one fact: good availability is a team effort. It requires the cooperation of everyone in an aviation unit from pilots to the newest crewchief. Platoon leaders, the ops officer, the XO and the CO, and even the refueling truck operator and the cooks are involved. Mechanics, tech inspectors, the maintenance officer, supply clerks, the people at support levels of maintenance even back to AVCOM—all of these people are directly involved in the unit's efforts to meet its operational requirements.

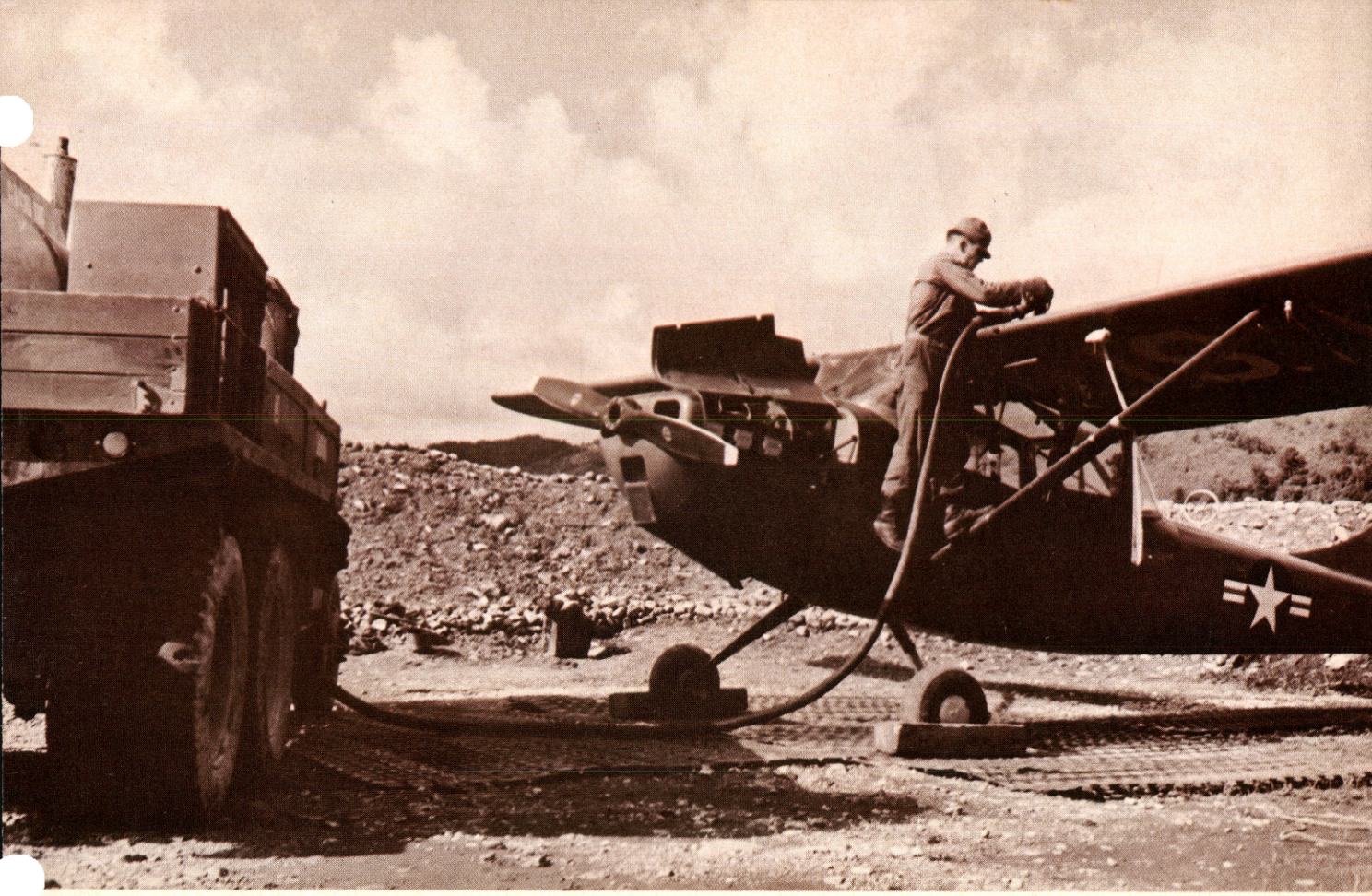
You find this hard to swallow? How can a pilot, for example, affect availability? Here are a couple of ways; there are more.

PILOTS AND AVAILABILITY

The newly assigned aviator is at the controls on a routine mission, straight and level. He's doing all right and his aircraft commander relaxes. When the new driver sees the old hand settle down, he relaxes slightly, too. But then he feels a twitch or two in his cyclic control. He becomes alert again and looks around to see if the aircraft commander no-

All too often maintenance is expected to keep up that magic figure of 22 or 23 out of 25

MAJ Jones is Assistant Chief, Maintenance Section, Aircraft Maintenance Branch, DCSLOG, Ft Rucker, Ala.



ticed. No. He thinks about it a couple of minutes, trying to remember his maintenance training, waiting for it to happen again. When it doesn't, he passes it off and resumes his relaxed flying. The flight is over; he doesn't even remember it.

So what? Well, it might be that his aircraft had been having trouble with the servos or the magnetic brakes in the force trim. The crewchief would have known about it. He would have repeated it to the flight line crew and it could possibly have been adjusted in a matter of minutes. As it is, the pilot flying the aircraft tomorrow might have to abort a mission if the problem progresses. One more aircraft "down."

That same day "Cowboy Joe" hits the range. He kicks his aircraft in the tail, pulls pitch, and is off in a veritable cloud of dust. But sometime during that rapid pedal turn, the high speed takeoff run, and the inevitable cyclic climb, a small crack appeared on the underside of the tail boom. As the cowboy continued in his day's mission, the crack grew. When the crewchief pulled his "daily" that night, he noticed the crack. Result: the cowboy's horse has to be reshod. One more "down" for unscheduled maintenance.

COMMANDERS' IMPACT

In the earlier illustration involving the ops officer and the battalion operations center, the importance of both positions was apparent. To stress that point, the aircraft that "new guy" was flying was one of the ships that maintenance had planned to work on that afternoon. And Cowboy Joe had already settled down to a day off, writing letters and playing cards. He doesn't normally "cowboy," but he'd been flying a lot lately, needed a day off, and was, frankly, a little teed off at being called out for this unimportant mission. Cowboy Joe's platoon leader knew Joe was unhappy and knew that he'd been flying hot and heavy for the past week, but Joe was low man on the platoon's time board that month. He'd been sick a couple of days two weeks ago and everyone had gotten the jump on him. "Sorry 'bout that."

The XO? While the maintenance officer was on a test flight, the XO had called the hangar to have the other test pilot report to the orderly room. Monthly inventory or something. Result: When the next two aircraft rolled out for runup and test flight, the line crew had to wait for the maintenance officer to get to them. So what? In Vietnam, they're "combat flyable" and count on the plus side, for availability purposes anyway. But can they be used in that 0530 assault coming tomorrow morning? Eyewash.

How about the CO? Practically everything the CO does has wide impact on availability rates. His policies and attitudes are of vital importance to maintenance efforts. A maintenance wise commander is the best friend a maintenance officer ever had—but being maintenance wise doesn't mean that the commander should tighten every nut or look over every inspector's shoulder. He knows when to delegate responsibility and how to maintain confidence. He knows that the hangar is not a place to discuss technical or engineering theories. He asks his MO instead, "How many would you like to work tomorrow? Can you get out 19?" He tells maintenance when there's a big push scheduled in two weeks and then follows up to see that everything possible is done to meet the requirements, *if* problems are forecast.

SUPPORTING ELEMENTS

How about the company's cooks? Can they affect availability. Admittedly a little farfetched, but they can. They can run behind on the chow schedule and cost crewchiefs and mechanics a valuable half-hour's daylight. The crewchief who had intended to go back to his "bird" right after chow all of a sudden doesn't have that hour or half hour of daylight to spend on correcting those few "minor" writeups. So he lets the writeups go and the conditions exist and progress another day. But that's just one man. How about the fiveman PE crew and the two crews pulling intermediates? Multiply those 15 men by half an hour each, and you've lost 7½ hours of valuable daylight. All because the cooks were half an hour late.

If the refueling truck driver misses one aircraft on his final round of the day, it will cost 15 to 30 minutes the next morning. That's 15 to 30 minutes when the aircraft is technically available. But is it? If your unit were ordered to evacuate the airfield during the night, could it go?

Supply people? All they do is give you parts and requisition replacements. The most obvious effect they have on availability is when they don't have the parts you need and can't fly without—you're EDP. That is the case when the part is needed for an aircraft.

How about the whoozis for the air compressor? Sheetmetal is no good at all without air. We requisitioned the whoozis two months ago and it's still not in. Why?

Many people play roles in the aircraft availability factor. The commander, his executive officer and the maintenance officer (above) are most important. But others such as the man who drives the fuel truck, the supply people and even the cooks (right) have a definite affect on aircraft availability.

The clerk copied the wrong federal stock number onto the requisition and the DSU cancelled the requisition back. It's over in that stack waiting to be posted to the cards and the register. The DSU editor could have taken the part number and noun and researched them, but his supply officer has been having a hard time with this unit and the word's out—"If there's anything wrong, cancel it back."

But that's being a litle harsh on the DSU. Maybe the supply catalog doesn't have the part number listed, or maybe the catalog has a couple of numbers inverted. The result is the same: the requisition is cancelled and you don't get the whoozis.

SUGGESTIONS FOR MAINTENANCE

If you have now seen how just about anyone can affect availability, we'll now get to the man who has the largest impact on availability: the maintenance officer. *Some* of the ways that have worked before to improve a unit's performance will be discussed below:

• Don't over-maintain your aircraft. This is nearly as detrimental to unit effectiveness as under-maintaining is. An aircraft doesn't have to be perfect everytime it comes out of your hangar. It is not unusual to find an inspector who, in his zeal to do a good job, condemns parts that are worn but are still within tolerance. An inspector of this type is a very valuable asset if his tendencies are recognized. But he, like the rest of the mechanics in any unit, should be reminded that tolerances are computed for a purpose and include a very real safety margin.

If you spend time replacing a tail rotor bearing that's still within tolerance, you're wasting time —and not only the time spent on that job. What would that man have been doing if you hadn't had him on the tail rotor? You've lost the 3 manhours spent on replacing the bearing *plus* the 3 manhours the man would have spent on the other job. Your total loss is 6 manhours in a 3 hour period for one man. And why? A bearing was worn—but within tolerance and therefore still SAFE. Your job is to produce SAFE aircraft, not necessarily PERFECT aircraft.

• It's easy for people in support levels of maintenance to

Better Aircraft Availability

agree with a discussion of this type and say, "Yeah, he's talking about organizational maintenance." That's not true. Tolerances don't change with levels of maintenance. Twenty thousandths allowable clearance at second echelon doesn't become .015 at third or .010 at fourth echelon.

Remember that the aircraft you're working on belongs to a unit maintenance officer and he needs it. He didn't give you a work order to IROAN the aircraft. He wants the hard landing damage repaired. He's confident of his unit's ability to police up their share of the work and, unless he's specified otherwise, he wants the aircraft back as soon as you can fix it. Give him a safe aircraft. Let him decide on his own degree of perfection. You might prefer to have 14 or 15 relatively perfect aircraft in each unit, but the unit commander can do a more effective job with 20 safe aircraft.

• Put your best qualified people closest to the aircraft. Be sure that a good "daily" is performed and that your line maintenance chief is capable of making good decisions on what should be done now and what can be safely deferred. You can sleep soundly then. The people who perform these functions keep a unit flying safely. They see every aircraft every day and must know the quirks of each. They closely watch the progression of problems and try to correct each as early as possible. They decide when to ask your foreman to put the bird in the shop and when to carry it to its next scheduled maintenance. They've got to be good—some of the best you've got.

The flight line crew and crewchiefs keep you in business, meet your expenses. The intermediate, periodic, sheetmetal and engine crews are the people who make your profit. Good people in these jobs, by doing work that holds up and doesn't have to be redone, cut down on your unscheduled maintenance workload.

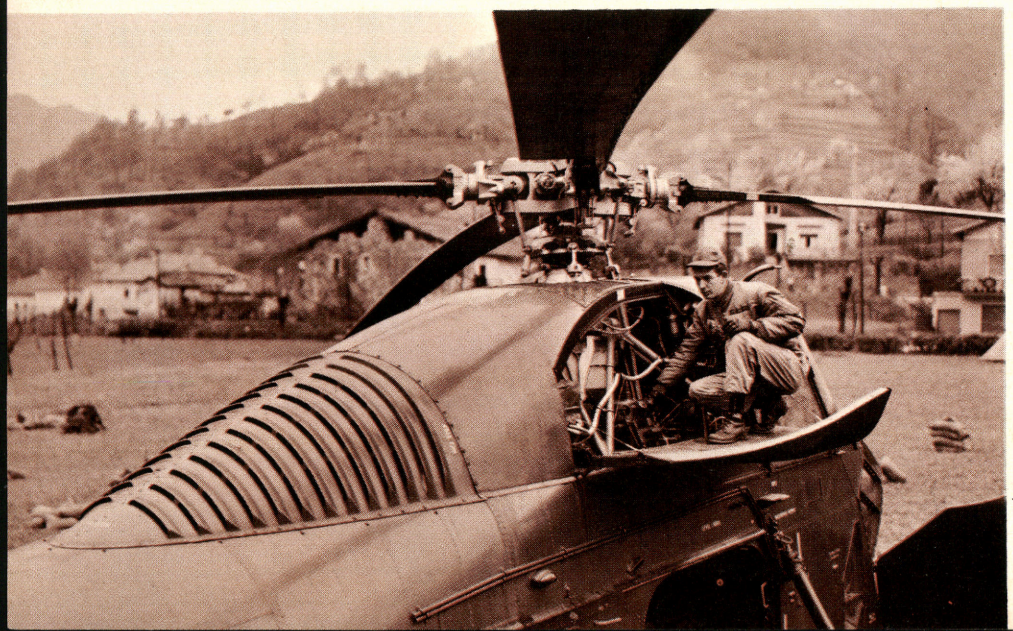
• Plan to maintain your birds when the ops officer doesn't need them. When's that? Usually at night, granted. By putting half your people on 8 hour shifts and splitting them, half your crews on days and half on nights, no one crew is overworked. At organizational level this is often difficult, but in a unit which is supported by a third echelon detachment a pooling of manpower can be accomplished. This permits makeup of seven or eight five-man crews and results in enough flexibility to work 16-20 hours a day on a single aircraft without overworking anyone. It also prevents the duplication that results when the organization has to button up the aircraft to give it to field maintenance to unbutton, fix and button up again.

• Hold up your end of the supply system. Get those unserviceable components turned in as soon as you can. Be sure that they're preserved properly and that the DA Form 2410 series is properly filled out and distributed. Have *you* ever gotten a component through supply channels that you couldn't use due to incomplete or missing historical data? Frustrating, isn't it? If every unit makes max effort to eliminate these mistakes within its own unit, we'll all profit. Indoctrinate your supply people to doublecheck all their work. In an earlier illustration the impact of one misplaced digit on a requisition was shown. Cut down on your cancellation rate and you'll improve your parts stance.

• Even out the peaks and valleys in your workload. Pipe dream? Maybe, but between you and your ops officer you can certainly reduce fluctuations to a more acceptable level. Ask the ops officer to talk to the people that you support, or arrange to conduct a briefing session yourself. Explain something of the complexity of your aircraft to them, and stress the requirement for 1 or 3 or 13 hours of maintenance for every hour's flying that you give to them.

Ask them to cooperate with you and release the aircraft as soon as they can reasonably do so. Show them that this action on their

Ninety percent aircraft availability is possible, but it takes a concentrated, coordinated effort by everyone in an aviation unit



part will give you the chance to work in the daylight, will increase your maintenance scheduling flexibility, and will quickly show dividends in the form of more and better aircraft available to support their big pushes.

One division advisor in Vietnam, for example, established a mandatory "release time" of 1500 hours. This requirement was waived for special missions, of course, but maintenance prospered. And aircraft crews appreciated it. It showed, too, in everyone's willingness to work for that division.

Defer all the maintenance that you can until a scheduled inspection (intermediate or periodic) falls due. When you have a surplus of flyable—hallelujah!—don't hesitate to pull a periodic or a couple of intermediates five or so hours early. You can't decide to do that the day this auspicious occasion arises, though, or ops will have the aircraft you want to work out on a mission. You've got to project your schedule as far into the future as possible. You *must* decide not later than the night before you plan to spring the big one and coordinate it with ops, with the platoons, with the CO. Coordinate it with anyone who'll listen to you. The more people who know your plans, the better chance you have of succeeding.

Project your parts requirements. Everyone, we assume, now recognizes this need as far as TBO (time before overhaul) items are concerned. But what about the thousands of parts that aren't on the TBO schedule? What can you do to project these requirements? You can keep a record of the items that you're deferring. For example, that leaking grip seal on the main rotor hub you're trying to stretch to PE will require either a parts kit or a hub. You've got a hub but no kit. Well, requi-

. . . produce *safe* aircraft Not necessarily *perfect* . . .

sition the kit now! You may have it when the ship comes down. Though even if the kit arrives before the PE is due, you may decide to change hubs and then install the seal kit when you have the time. But do you see the flexibility that you have gained because you requisitioned the kit as soon as you recognized the requirement?

Another way to organize your unscheduled parts projection is to inspect every aircraft closely at 2nd or 3rd intermediate, depending on the intensity of your unit's flying program. Look at the aircraft closely and determine what you'll have to change at periodic. Then requisition those parts. Collect them and when the aircraft rolls into the barn at PE, hand them to the PE crew. On the first four or five aircraft you'll simply be making educated guesses, but as you get experience you'll improve. Try it. You'll cut your EDP rate.

• Train your people. If you're in Vietnam and your unit is organized into two shifts, you can probably arrange for an hour's instruction at the end of the day shift two or three times a week. If you're in a CONUS or garrison situation, you can use some of the commander's open time on the training schedule. Use this time to instruct in the specific areas your unit is weak in. Have your technical inspectors and best mechanics teach the peculiarities of your aircraft. Have classes on procedures that your unit uses. Encourage discussion of these procedures. The inevitable suggestions may be worthwhile, might streamline your procedures. Instruct in anything that you can think of that isn't normally considered part of the general Army Training Program but that will improve your unit's effectiveness.

Don't limit your training sessions to these informal sessions either. Switch your people between jobs occasionally. This breaks the monotony for them and improves your flexibility. Have your key leaders help your less experienced people along.

• Don't neglect the test flight area. The maintenance officer is usually the unit's primary test pilot. As such he is directly responsible for the capabilities of the flight line and troubleshooter crews. Every flight line mechanic should be well trained in inflight troubleshooting procedures and in helicopter units in tracking and balancing out vibrations. In this connection, a test flight should never be flown solo. The test pilot should have a troubleshooter trainee or a test pilot trainee on board every time he leaves the ground.

When maximum availability is required, test flights should be flown as soon as the aircraft is ready. In combat zones, this means even at night. An aircraft that sits on the ground for 30 minutes to 6 hours awaiting test flight is of no value to anyone.

NINETY PERCENT

Ninety percent available? Yes, it's possible—even over a long period. But it takes a concentrated, coordinated effort by everyone assigned to an aviation unit. The key is the maintenance officer. He's the availability quarterback who calls the plays, even though he does it with occasional help from the coach (CO). Those plays make the unit's aircraft ready when they're needed.

Smoke In The Cockpit

Lieutenant John C. Logan

HI YA DOING, Frank?" Bob exclaimed as he walked into the coffee shop. "Long time no see. How's everything?"

"Aw, doing okay I guess, Bob. What brings you here? I thought you'd be on your way to Vietnam by now."

"Just about," said Bob, "leaving in two weeks. I came down with my CO to pick up some -10s for the crewchiefs assigned to our company and also to get some pilots' checklists if the school can spare any."

"I can see the -10s, Bob, but why the checklists? Practically all of you are just out of flight school and should have the checklist memorized by now."

"I feel the same way, Frank, but you know how some of these senior aviators are."

"I guess I should know what you mean. I had this major for a copilot the other day and he went around the ship reading his checklist like he had never seen a U-6 before. . . ."

A few minutes after I told Bob goodbye, my friend Jack Smith called. He said he had an administrative flight lined up to go to Atlanta tonight and wondered if I'd like to go along. He was leaving at 1700 in a U-6.

That gave me an hour to go home and get my gear and be back. I told him to go on out and file and I'd be back ASAP.

I was back at the airfield in 40 minutes and found Jack about halfway through filing. We were going to Atlanta to drop off a man who was taking emergency leave. The trip should be no sweat—about an hour forty-five up and the same back. I should be back and in bed by 2300.

The weather forecaster was predicting broken clouds at 4,000 with no showers or thunderstorms. It was fall of the year and flying conditions were good. We filed for 5,000 going up which put us in and out of the clouds. Both of us wanted a little AI time anyway. The winds were forecast at 310° at 10 knots.

A few minutes later we were taxiing out for runup. We had made a hurried preflight—but of course without the aid of the checklist. We didn't miss a thing as far as I know. At least if we did, it took care of itself since the flight went without a hitch.

We dropped our passenger off just in time to catch a plane to his destination and grabbed a quick cup of coffee.

Jack suggested that we divide the time so I flew back and he rode shotgun.

We jumped in hurriedly and started up. After getting taxi instructions, we started out to runway 09. We were about halfway out when I thought I smelled smoke. Jack confirmed that he thought so too. Both of us checked all the gauges and everything seemed to be in the green.

After getting our clearance and being cleared for takeoff, I still noticed the smoke and it seemed to be getting stronger. I pulled my window down and stuck my head out to see if it were possibly coming from the city somewhere. Not wanting to wait in that long line again for takeoff, I convinced myself that the smell couldn't possibly be caused by our airplane. With that, I closed the window, poured the coals to it and started my climbout. We were being radar vectored to the VOR so there was no problem on navigation. I unhooked my flashlight from my shoulder strap, laid it between the seats and told Jack where it was in case he needed it.

It wasn't long either! We had just leveled off at 4,000 and were released to resume our own navigation when all hell seemed to break loose. Everything went black and smoke began boiling into the cockpit from under the instrument panel. I yelled to Jack to get the flashlight while pulling my window down to try to clear some smoke out. It seemed we had lost all the electrical system. No radios or lights would work. Jack immediately shut the generator and FM switches off, which put everything on the battery.

In the meantime, I had unhooked the rear seat and was unstrapped and ready to go out. After what seemed like an eternity (but was only seconds) the lights slowly came back on. Jack keyed the microphone and found that it too was working again. Having just been released from Atlanta Departure Control we had not had time to change channels.

LT Logan was Administrative Officer, Dept of Maintenance Training, when he wrote this article.

Smoke began boiling into the cockpit from under the instrument panel

Therefore, we immediately gave them a call and explained our situation, requesting a radar vector back into Atlanta. This was approved and we were given a heading.

We were about 8 minutes out so this gave us time to try to analyze what had happened. Fortunately, the clouds had all dissipated and the sky was clear when it happened, so I was able to maintain control of the aircraft when the lights were off. The engine had not sputtered once, so we decided that it must have been some sort of electrical short —but where? Everything seemed to work OK on the battery, so it must have been a generator fire. At any rate, I didn't chop any power until I was sure I had the field made power-off. Have you ever overshot a 10,000 foot runway? I almost did!

The tower had crash crews waiting when we touched down. We were advised to pull off immediately and shut down in case of fire—which we did gladly. After a few minutes of probing around the aircraft with the crash crew to make sure there was no fire, we decided to start up and taxi to a hangar to get some maintenance people to look it over. I couldn't get the energizer to turn, so a towbar was brought out and we were hauled in. No maintenance personnel were around at that hour, so the proper calls were made to Cairns to advise them of our mishap and that we probably wouldn't be back until the next afternoon.

Atlanta Depot sent a man over the next day to look at the aircraft. You're right; the starter had burned up. What caused it? It's for sure that it would have happened had the energizer switch stuck in the up position (which it may have and snapped down later). However, it was down when we landed that night. I don't remember distinctly checking it down after start, but I had done it so many times in the past it was second nature. If it had stuck in the up position I would have found it if I had had Jack read the checklist off before taxiing and during runup.

This has certainly taught me a lesson about checklists. Before that, I had had other things happen that weren't quite as frightening—like forgetting my flaps during B phase strip work, not switching to the fullest tank during C phase and running out of gas during an approach, leaving the pitot tube cover on a Bird Dog and wondering what's happened to my airspeed on climbout.

All of these are things that could certainly have been prevented by *using* my checklist.

Now ask me who needs a checklist and I'll tell you right quick that *everyone does*. There will be no more smoke in the cockpit for me caused from not using my checklist.

Minipads in Vietnam

The 18th Engineer Brigade has come up with a system that sharply reduces the dust problem around heliports in South Vietnam.

THROUGHOUT Vietnam there is a heavy demand for heliports to accommodate UH-1 and CH-47 helicopters. Along the east coast of Vietnam most of the heliport sites are sandy or dusty during the dry season. During takeoffs and landings, the helicopter downblast raises thick, swirling clouds of dust, causing damage to engines and rotor bearings, in addition to blinding the pilots. The 45th Engineer Group has recently come up with a design to help overcome this problem.

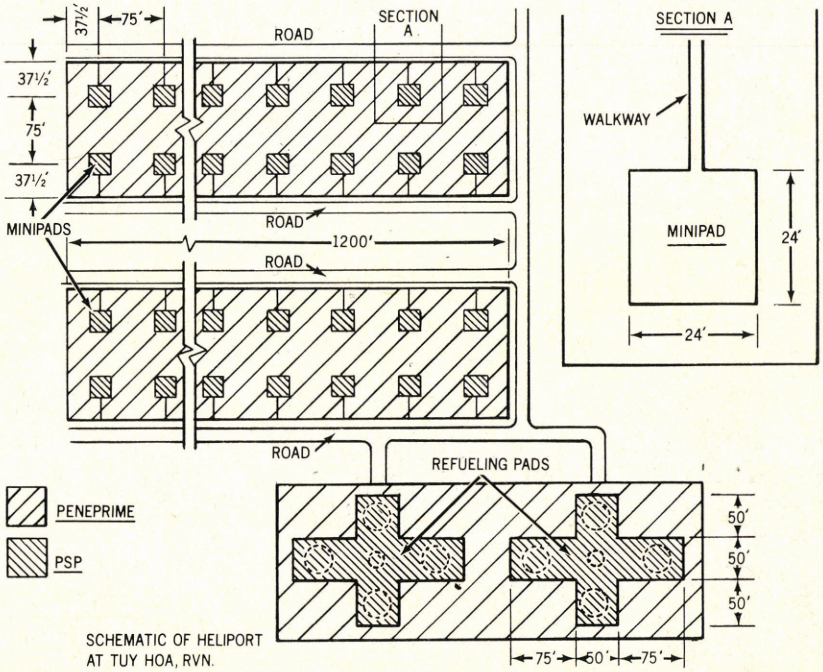
The new design calls for the construction of "minipads" and was made possible by the successful application of peneprime, a new dust palliative material of asphaltic base.

When an area has been selected as a helipad site, it is bulldozed, leveled and graded in the usual procedure. The entire area is then compacted with a sheepsfoot and/or steel wheel roller and sprayed with peneprime. The peneprime is usually applied with an asphalt distributor although, in difficult areas, a hand distributor can be used. When sprayed onto sand, the asphaltic substance binds small particles together, making the surface dust-free.

Peneprime requires very little settling time, and construction of the minipads is usually initiated immediately after the area has been shot (sprayed). A minipad is a 24-foot square of pierced steel plank (PSP) surfacing placed directly upon the compacted, peneprimed sand. They can be built separately or in groups, depending on the use and workload of the heliport. Walkways made of PSP are also provided to prevent disruption of the dust-free surface around the minipad.

Successful use of this design was demonstrated recently in an operation near Tuy Hoa, RVN. A severe dust problem existed that greatly limited aviation support given to combat operations in that area. Company B of the 39th Engineer Battalion (Combat), 45th Engineer Group, 18th Engineer Brigade, constructed a UH-1 heliport consisting of 64 minipads and two refueling pads (see figure). It consists of two sections of 32 minipads; the pads are located so as to accommodate helicopter and passenger traffic easily. The two refueling pads can handle eight UH-1s at one time. Both areas have access roads surfaced with laterite, a sand-clay mixture that is readily available in Vietnam. In all, over 38,000 gallons of peneprime and over 75,000 square feet of PSP were used. The minipads considerably reduced the dust problem and were built in only six days.

The successful use of peneprime and the new minipad design have provided a simple solution to a serious problem in the Vietnam war. The 45th Engineer Group has adopted the minipad design, or modifications thereof, for all of their heliport projects.



SCHEMATIC OF HELIPORT AT TUY HOA, RVN.

Operation 'Red Leaf'

The transfer of the U. S. Army CV-2 missions to the U. S. Air Force resulted in an interesting insight into joint maintenance management at the company/squadron level.

Colonel J. Elmore Swenson

UNDER WHAT conditions would an Army senior airplane mechanic serve as an "advisor" to an organic maintenance team of an Air Force squadron?

Where would you find an Army aviation company performing technical inspections of aircraft maintenance performed by an Air Force maintenance team of a combat crew training squadron?

The conditions are those created by Operation Red Leaf and the location is the 1st Aviation Company, 10th Aviation Group, Fort Benning. Operation Red Leaf is the designation given in the Joint Basic Plan for implementation of the well known agreement between the Army and Air Force Chiefs of Staff on 6 April 1966. The objectives of this plan were:

- To transfer the U. S. Army CV-2 missions and resources to the U. S. Air Force beginning in April and completed by 31 December 1966.
- To accomplish the transfer without disruption of the Army tactical capability.
- To phase the transfer to allow early Air Force assumption of the aircrew training responsibility with the Army continuing maintenance and logistical assistance as required.

The 1st Aviation Company, with its splendid record in Army fixed-wing aviation, was probably the first Army unit to feel the real impact of the decision to relinquish the faithful Caribou. Of course, the 1st has a history of "firsts." From its historic global deployment to Southeast Asia in 1962 to the present, including its outstanding contribution to the ALOC (air line of communications) concept during "Air Assault II," each mission has received the best of the 1st.

Could the company live up to its record in this obviously unique mission assignment? Morale of aviators and mechanics suddenly dropped to the lowest point in the unit history. Rumors and

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COL Swenson is CO, 10th Aviation Group, Ft Benning, Ga.

fears expressed by senior NCOs and Specialists were at an all time high. Would they be able to compete after retraining or reclassification into a new MOS? Immediately affected by the decision were 49 Caribou-rated aviators in the group, of which only two were dual rated. Other assets affected were the 22 CV-2 aircraft within the 1st Aviation Company, TOE of the unit, elements of TOE of the 254th TC Detachment (FM), and possibly a maintenance slice of the 609th TC Maintenance Company (DS).

Certainly! The 1st Aviation Company could be depended upon to turn in a commendable performance, even under these adverse conditions. Some of the pitfalls of Operation Red Leaf and the innovations for their solution represent a new series of "firsts" for Army aviation and should be examined further.

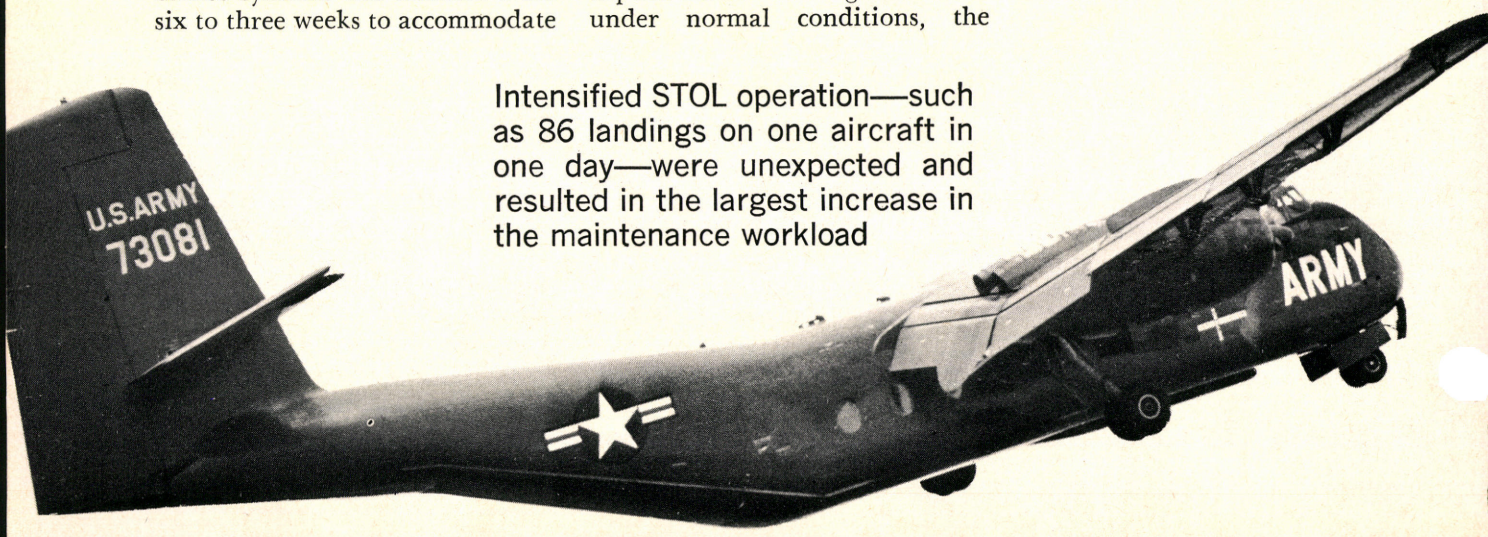
To begin the operation, 10th Aviation Group had the mission to "transfer operational training responsibility to the Air Force as essential Air Force training capabilities have been attained." On 30 April, the first Air Force student IPs arrived. Six Air Force students joined six Army transition students in Class 66-8, which was to be the last class for Army CV-2B transition students. The course syllabus was reduced from six to three weeks to accommodate the Air Force students with extensive multiengine flight experience.

The most significant problem encountered during the transfer was the maintenance workload increase resulting from the intensified transition training program. The Joint Basic Plan of 8 June had specified that the Army would be responsible for aircraft maintenance until 31 December 1966. Part of the increase was planned even before arrival of the first Air Force students. However, the factor contributing to the largest increase in maintenance workload came somewhat as a surprise. This was the aircraft wear factor increase. Intensified STOL operation, i.e., 86 landings on one aircraft in one day, and the resultant increased percentage of hard landings necessitated frequent aileron and flap damage repairs. Eighteen engine changes were required in a two-month period.

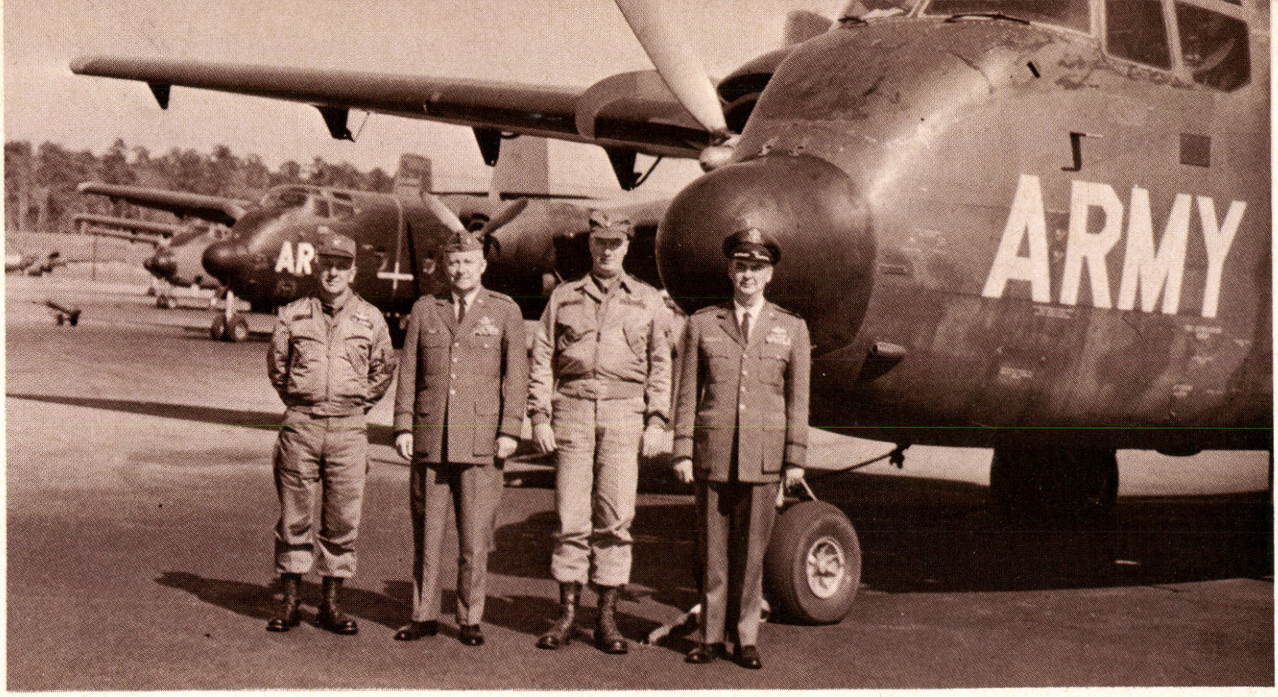
A large percentage of these increased wear factors would apply to any aircraft during an intensified transition program. The surprise element was that the severity of wear factor increase was directly attributable to the very student input criteria which was anticipated to reduce it, as well as the length of transition training time required. In retrospect, it may be that the greater the experience in multiengine aircraft under normal conditions, the more difficult the transition to true STOL operations under field operating conditions. Students with greater multiengine jet aircraft experience had to completely relearn reciprocating engine handling techniques (rpm/manifold pressure control). Engines and major Caribou components suffered.

To prepare for the planned increase of maintenance workload, the 1st Aviation Company and 254th TC Detachment had initiated double shifts totaling 18 hours per day in April. By 11 June, the transition program required ten aircraft per day, six days per week. Individual aircraft were averaging approximately 15 hours per week in flight time. Add the surprises in wear factor increase and it is apparent that all organic maintenance assets were committed.

How would the company now provide OJT (on the job training) for practical training of the 4449th CCT Squadron (Combat Crew Training) personnel without interrupting the maintenance effort? The 4449th CCT Squadron had been activated on 1 May 1966, and was now beginning to fill with maintenance personnel of varying experience levels. The



Intensified STOL operation—such as 86 landings on one aircraft in one day—were unexpected and resulted in the largest increase in the maintenance workload



It is an historic moment as the U. S. Air Force receives the responsibility for U. S. Army CV-2 missions. Key officers involved in the transfer of Fort Benning CV-2 assets to the Air Force are (left to right) COL J. Elmore Swenson, commander, 10th Aviation Group; LTC Harold Bailer, commander, 4449th CCT Squadron; MAJ Richard A. Lochner, commander, 1st Aviation Company; and LTC Wayne Witherington, operations officer, 4449th CCTS.

601st Field Training Detachment was activated on 8 June and had established classroom type training facilities at McKenna AAF. At this time, the 601st was turning out the first group of maintenance personnel for the 4449th CCTS. These filler personnel had received a two-weeks CV-2 ground school orientation as they arrived. It was now necessary to provide additional training by OJT.

Herein lies the most unique of the Army aviation firsts involved in the transfer operations. An "over-the-shoulder" training system was jointly agreed upon by the commanders of the 1st Aviation Company and the 4449th CCTS in early August. The system called for initial assignment of an Air Force maintenance technician to an Army supervisor/counterpart. As the Air Force enlisted man became proficient in his specialty, he was ready for integration into a joint maintenance team. The joint maintenance team was supervised by an Air Force NCO, with an Army "advisor" maintaining overall control.

As the Air Force team chief became proficient, the Army advisor dropped out of the supervisory chain. As sufficient teams became proficient, further joint reorganization resulted in the 4449th CCTS assuming the workload under the Air Force system of maintenance management. The Army retained quality control until approximately 15 November, at which time the Air Force also assumed this responsibility. After this date and until 31 December 1966, the Army retained "advisor" status only at company/squadron level.

Operation Red Leaf afforded 10th Aviation Group maintenance personnel a rare opportunity to observe, at first hand, adaptation of the more time-tested Air Force maintenance management system to an "Army" aircraft. Observation of the transfer at unit level has indicated that the Army could well benefit from a further study of certain management procedures used in an Army aviation company versus an Air Force squadron. A step-by-step analysis/comparison of subordinate management devices is truly feasible only under such rare circumstances when both systems (in part) are being used concurrently at the unit level.

A few of these management devices deserve further study because they are uniquely adaptable to Army airmobile companies as they exist today—with a TC detachment attached. Further, Army requirements for greater separate company mobility and self-sufficiency should not be overriding considerations when the company is supporting a counterinsurgency operation. Airmobile and medium helicopter companies operating within and from relatively large secure areas have established a need for greater maintenance mission orientation. Flyability rates demand more attention to the maintenance mission and the attached FM detachment is a partial solution.

Specific examples of areas within the Air Force system that are worth further study as to adaptability are:

• "Pooling" of maintenance specialists, up to and including a

'Red Leaf' gave the Army a look at a time-tested maintenance system

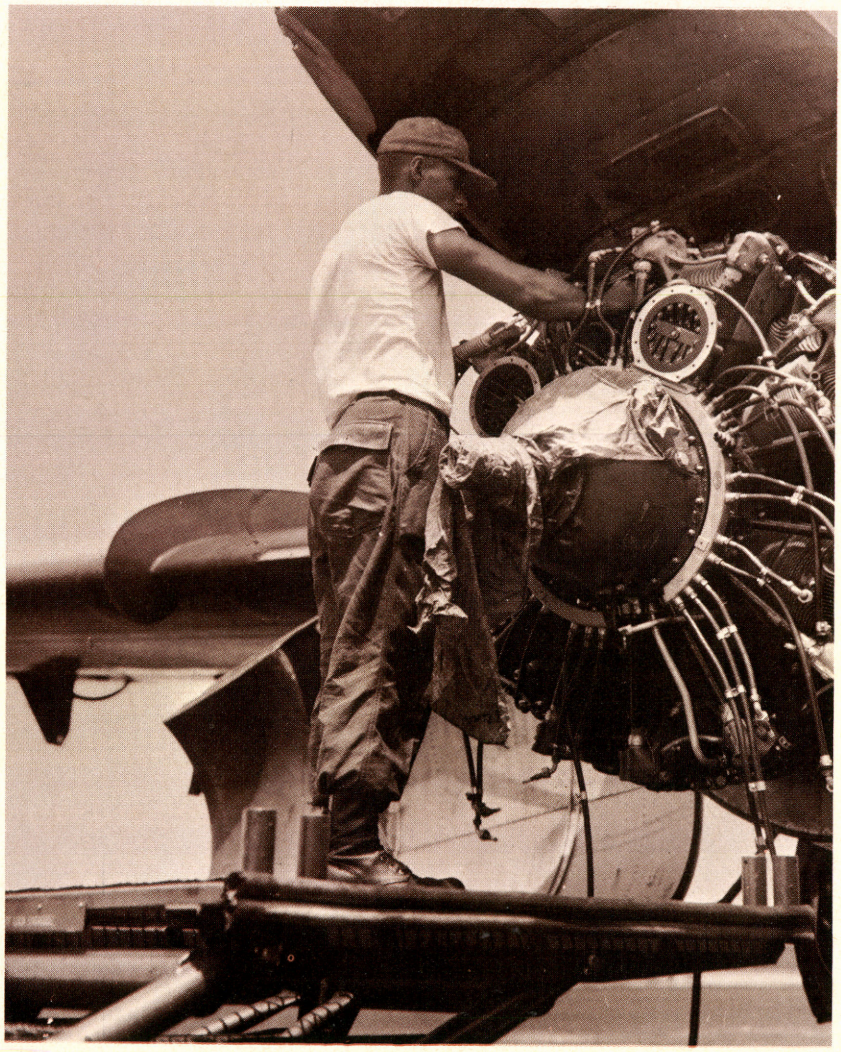
limited GS capability, immediately responsive to a single flight line maintenance dispatcher. This includes response to both preplanned and unscheduled maintenance requirements.

• An adequate flight line transportation and communications net permitting rapid movement of specialist personnel, materiel, and transmission of instructions and requests.

• Simplification of flight line job order documentation.

• A single Maintenance Management Manual which is all-inclusive of subordinate headquarters revisions and supplements using page insert type revisions when required. Air Force Manual 66-1, Maintenance Management, provides such a reference. TAC supplements are issued as different colored pages and are inserted wherever the revision is applicable. The combination includes common systems for unit records, aircraft technical supply, flight line maintenance control, and all other aspects of aircraft maintenance management under the single cover.

Eighteen engine changes were requested in a 2-month period



Advantages of the Air Force squadron system of maintenance management are as follows:

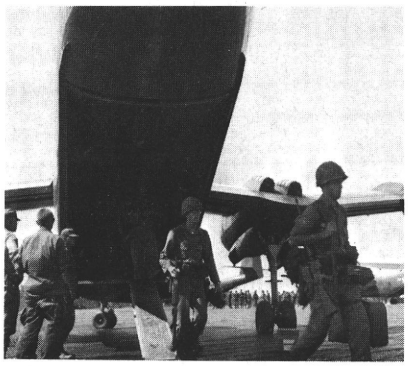
• The squadron is more self-sufficient from the maintenance standpoint than the Army aviation company. The squadron has the approximate equivalent of the Army TC detachment (FM), direct support company, and a limited GS capability.

• The squadron is more maintenance-mission oriented than the Army aviation company due to a lack of diversity. (The responsibility for mess, security, and vehicle maintenance is removed from the squadron commander.)

• The squadron maintenance officer maintains continuity of effort by his more extensive authority for local "fix" of subassemblies, avoiding such heavy reliance on the supply system. This continuity is further enhanced by elimination of separate unit variations in SOP, the resultant reduction in documentation of job orders and the rapid response of more highly skilled personnel to flight line requirements.

Bismark, the great Iron Chancellor of Germany, once said, "Only fools learn from experience; I learn from the experience of others." It has also been said that "history repeats itself." During Red Leaf, the Air Force, "grandaddy" of all the flying business, returned to the Army for flight training. Interesting firsts developed throughout the operation. Should we wait for history, or should we gain from the experience of long-time maintenance managers as applied to our common friend, the Caribou?

CV-2 CARIBOU

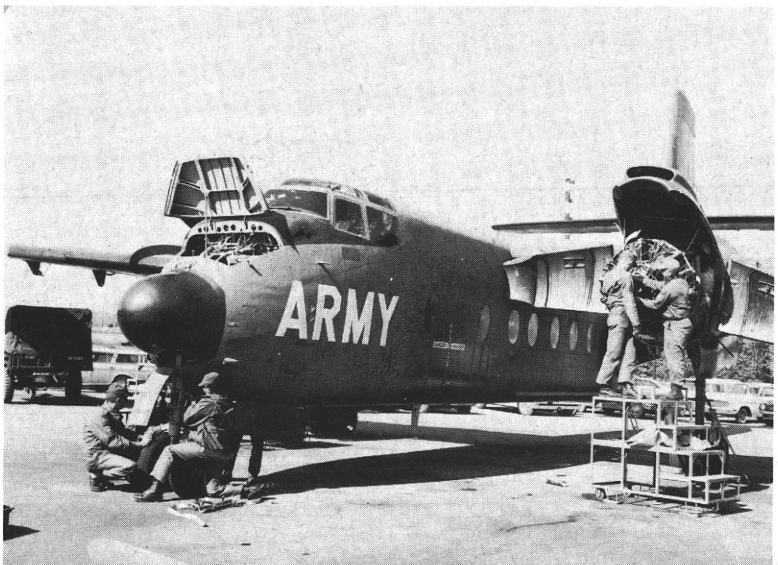


THE ARMY accepted its first three Caribou on 8 October 1959 at the de Havilland plant (upper left). The new transport immediately underwent a series of tests climaxing in a troop test at Ft Benning, Ga., from 16 April to 15 June 1961 (upper right).

The Caribou participated significantly in the rapid growth of Army aviation's capabilities early in the '60s. In the top photo crewmen refuel a Caribou after the historic flight of the 1st Aviation Company from Ft Benning to the Far East in the summer of 1962.

In Vietnam, the Caribou proved its value beyond question performing all conceivable transport missions. It helped transport elements of the 1st Cavalry Division (Airmobile) arriving in Vietnam in August 1965 (second from bottom).

Finally the Caribou missions transferred to the U.S. Air Force whose personnel assumed the air crew training responsibility after receiving training from the Army at Ft Benning (bottom photo).



Staff Sergeant George L. Maillet

Communication between controller and pilot is of utmost significance, especially during these days of overcrowded skies.

ROGER WILCO, OVER AND OUT

HOW MANY TIMES have you squirmed in your easy chair when you've been watching an antiquated WW II movie and heard this expression? Plenty I'll bet.

"Safe, orderly and expeditious flow of traffic on and in the vicinity of an airport."

From the time a person enters the field of air traffic control, he is taught to keep this phrase in mind. His entire career as a controller revolves around this statement.

The air traffic controller is governed by a stringent set of regulations, contained in the ATP 7110.1B—ATC Procedures, which has been adopted by the Army and designated TM 11-2557-27. The foreward in this publication reads:

"This ATC Procedures Manual is one of the Air Traffic Control Manuals referred to in Part 65 of the Federal Aviation Regulations. It prescribes procedures and accompanying phraseology to be used by personnel of all facilities providing air traffic control service. Controllers are required to be familiar with all provisions of this manual and to exercise their best judgment if they encounter situations not covered by it."

What would happen if we were to operate aircraft, in and out of an airport, without benefit of a control tower? Especially what would happen if this airport boasted a traffic count of more than 1,000 operations a day? It would probably result in complete chaos and disorder. We would be required to station sweepers at strategic points along the runway to clear off debris left by pilots who thought there was enough separation between theirs and the preceding aircraft.

Many pilots are left with a "bad taste" stemming from instructions received from a controller who has told him to go around or to make a 360 on final for spacing. Instructions of this sort are given only when corrective action must be taken. Sometime we find the overzealous controller, who would rather be "safe than sorry." He sometimes issues instructions prematurely which may cause a slight delay. A controller's judgment improves in direct proportion to his experience. Keeping this in mind, it is much better to control a situation a bit early rather than too late.

THE CONTROLLER

Generally, the air traffic controller is a dedicated man. Not only is he dedicated to the Army but to the field of air traffic control as well.

A young man entering the Army who cannot become an Army Aviator usually chooses the next best occupational specialty, which in this case is air traffic control.

In many instances the military controller is a rated civil pilot. His training begins with a grueling 17 weeks at Keesler Air Force Base in Biloxi, Miss. A wide variety of subjects is covered to include weather, navigational aids, civil air regulations, airport traffic control, and air route traffic control.

Upon completion of this course, he is subjected to another 4 to 6 months of on-the-job training

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SSG Maillet is a senior air traffic controller, Cairns AAF, Ft Rucker, Ala.

which is culminated with an examination (written and practical) administered by an FAA examiner. On successful completion of this test, the controller is then certificated by the FAA as a junior controller.

The way has now been cleared for the controller to really begin studying this complex field.

First, there is a local area which must be memorized. This area usually encompasses a 50 mile or more radius to include all airways, VORs and their frequencies, holding patterns, intersections and the VOR radials which make them up, and the distances between various fixes. When a pilot reports over a point, the controller must be able to visualize his position in relation to the airport.

Now we come to the "giant killer"—the 200-mile area map, which must also be drawn from memory. This, coupled with mastering the intricacies of conventional approach control, prepares the aspiring controller to once again face the FAA examiner in hopes of obtaining a Senior Air Traffic Controller's Certificate.

The entire process of training covers a period of 6 to 9 months. The junior and senior phase of training must be repeated each time the controller is transferred to another control tower.

SOME OF THE PROBLEMS

A look at some of the typical mistakes will illustrate some of the problems encountered by both the controller and pilot.

A controller plans his traffic well in advance, sometimes picking out a spot on downwind or on the base leg where a landing sequence will be issued to the pilot. If a pilot initiates the call up well before entering the traffic pattern, he is expected and planned for by the controller. In many instances pilots make the initial call when turning onto the downwind leg or entering the pattern on an extended base leg. This will work just fine providing it happens at a time when not much traffic is in the area. However, during peak traffic periods it can become what is known as the "controller's nightmare."

Many controllers fabricate their own problems by what is known as "overcontrolling" and "undercontrolling." Overcontrolling simply means that some of the instructions or advisories issued to a pilot are not necessary. Undercontrolling is just the opposite—there is not enough detail in the instructions.

A controller should strive to make all of his transmissions mean something. For example, when a pilot calls the tower requesting a right turn out of traffic and the controller replies "Roger," this can only mean to the pilot that the controller has received and understands the transmission. It does not constitute approval or disapproval. Above all, the controller must be specific in his instructions. A pilot cannot be held responsible for noncompliance if he does not understand what he is to do. If for any reason a controller is unable to approve a pilot's request, the pilot should be given the reason for disapproval, time permitting. A pilot will more readily comply with such instructions if he understands the particular situation.

Our jobs as pilots and controllers involve great responsibility. We must remember that a pilot is in no position to control air traffic from his vantage point; by the same token, the controller is in no position to fly the aircraft.

We should all strive to stay abreast of the ever-changing regulations governing flying and air traffic control. In this way we can all be instrumental in keeping Army aviation the great organization that it is.

If you are ever visiting a control tower at the time a shift is being changed, you'll probably hear something like this: "Here comes our relief. Let's go for a cup of coffee." And over that cup of coffee, you would probably hear him say to the other. "How about that go-around I gave Army 12345; do you think I could have waited a little longer?"

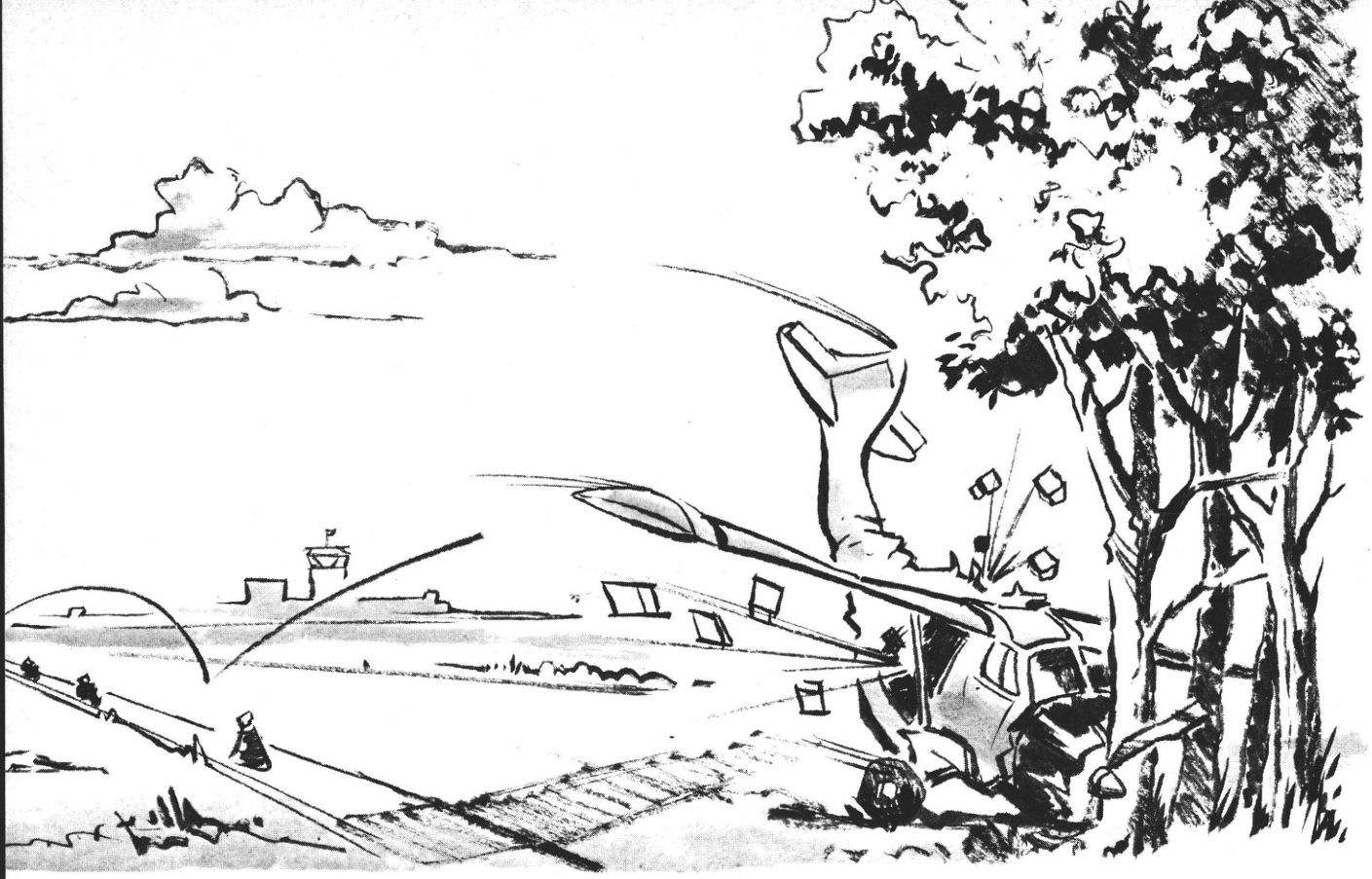
A Few Points to Remember

FOR THE PILOT

- Monitor the frequency before you transmit. You may be cutting someone else out.
- Be as accurate as possible in reporting your position. This will help the controller to plan accurately for you.
- Be specific in your requests.
- If you don't receive an answer immediately, be patient. The controller may be talking to someone else on another frequency.

FOR THE CONTROLLER

- Be specific in issuing instructions. A pilot must understand what he is to do.
- Use good phraseology. It saves time and trouble.
- Tell the pilot the reason you cannot approve a request. It makes for better relations.
- Always put yourself in the pilot's place. Ask yourself how you would react if you received your own instructions.



NEED HELP AT YOUR DESTINATION?

If you encounter difficulties at your destination, you might consider RVR—runway visual range—which is a mechanical system that looks down the runway at the lights and states exactly how far down the runway it can see.

Captain Peter H. Mitchell

Lt William F. Winblood, Jr.

YOU REPORT your last intersection and turn toward the locater outer marker for an ILS approach. It's been a long, hard flight, and you think longingly of a hot shower, a good meal, and a little bit of relaxing entertainment. Suddenly, you realize that the weather being reported to you at this time includes an existing visibility below the authorized minimums. Your teeth grind together in disgust. After

flying all day to reach your destination, Lady Luck has chosen to send you to your alternate—or has she?

Not too long ago you would have been forced to proceed immediately to your alternate if the weather was reported below minimums (AR 95-2, para 20d). But now, at this point in time, you note that either Sliding Scale or RVR may be applicable. If they are, you may at least be able to begin the approach and you have a good chance of completing your mission.

In the back of your mind is a nagging thought: "It's there, but what is it? Can I use it? How do I use it?"

Even if the AR is aboard, this is not the most feasible time to drag it out and try to figure it out. The time is now too short to start doing research and trying to understand something you've never heard of. So let's try to blow the smoke off RVR and while we're at it, let's also consider Sliding Scale.

First of all, what is RVR? It stands for runway visual range and is a mechanical system that looks down the runway at the lights and states exactly how far down the runway it can see. If it can see down the runway a certain distance, then you should be able to see the same distance with your uncorrected 20/20 vision. Sound a bit more accurate than the normal weather reporting procedures? You bet.

Standard card holders may use RVR anytime they are authorized on the appropriate approach plate, in your case DOD FLIP. Further, anytime RVR is reported,

Standard cardholders can use RVR if it is authorized in the DOD FLIP

whether published or not, you must use it.

The first step therefore is to commit to memory the appropriate equivalents which follow:

RVR 24 = 1/2 mile

RVR 40 = 3/4 mile

RVR 50 = 1 mile

RVR 60 = 1¼ miles

Now that you have that down, let's see how it works.

When RVR is published *within the confines* of any block on the approach plate, it may be used as your *sole minimum* regardless of reported ceiling or visibility. Thus, if the minimums published are 400-1 or RVR 40 (in the same block) you may begin the approach if the reported RVR is equal to 40 or greater, regardless of the reported ceiling or visibility.

If it had been reported as ceiling 200, visibility 1/2 mile, RVR 40, the RVR is equal to what you need so you may begin the approach, but you must *level off at the published altitude;* in this case, 400 feet. Conversely, if the reported weather was ceiling 400 feet, visibility 1 mile, but the RVR only 30, you can't go in—it's less than 40. So you can see that one fact becomes instantly evident: the given RVR must be equal to that *published* before you may substitute it for both ceiling and visibility.

Suppose RVR is *not* published on the approach plate, yet approach control gives you an RVR report. In this case the only item you may substitute RVR for is visibility.

For example: Your approach plate minimums are ceiling 400 feet, visibility 1 mile. You know the equivalent RVR for 1 mile is RVR 50. On the way in approach control reports "Ceiling 400, visibility 1/2 mile, RVR 50." No problem; RVR 50 equals 1 mile so in you go, again *leveling off at the published altitude.* But suppose they say "Ceiling 300, visibility 1 mile, RVR 50." RVR 50 does equal 1 mile but your ceiling is 100 feet below that published. So since RVR was not published on the approach plate, and all you may substitute RVR for is visibility, you can't go in. So you can see that one fact really stands out when RVR is not published, all you can substitute for is visibility—the ceiling must be equal.

So now let's move on to Sliding Scale, shown on the approach plate as S/S. Sliding Scale lets you drop 1/4 mile of visibility for each 100 feet you add on to your ceiling down to a visibility of no less than 1/2 mile. If you should have a minimum printed as 400-1 S/S, you can accept a *reported* ceiling of 500 feet, visibility 3/4 mile or ceiling 600 feet visibility 1/2 mile (but never less than 1/2 mile). Of course your new level-off altitude will be the altitude you converted to. As you can see S/S becomes a real fine system when your ceilings are pretty good, but the visibilities leave a bit to be desired as happens around most of your metropolitan areas. And after all, isn't that where most of the Playboy Clubs are?

We hope these explanations help you understand RVR and S/S. They aren't really so confusing after all and they sure have prevented a lot of aviators from having to move out smartly to their alternate.

When they wrote this article CPT Mitchell and LT Winblood were assigned to the Academic & Synthetic Trainer Div, Dept of Fixed Wing Training, Ft Rucker, Ala.

DO YOU HAVE

That 'Exceptional' Touch?

Captain Glaston J. Ford, Jr.

"I'LL BET YOU that I can take this chopper off and land it with less power than you can." When was the last time that you made this statement to your copilot? Issue this challenge to someone soon and see how smooth your control touch is.

Just what is control touch? How about the delicacy with which one performs coordinated control movements. In other words are you rough on the controls? Do you "rattle the cyclic" all over the cockpit, or do you handle the controls in a smooth, deft manner? Do you overcontrol, or do you use only the graceful slightness of control movement necessary to get the job done.

Now let's look at coordination. Even if we possess the ultimate in the finesse of touch it will be of little value if we are unable to manipulate all controls to achieve the perfect or near-perfect end product. Therefore, let us think of control touch and coordination as being a happily married pair.

What does control touch mean to you, a VFR pilot? Nothing—that's what those instrument drivers need; they're the ones who must maintain specific altitudes and make minute control movements to keep those gauges from jumping all over the place. If this is the completeness of your belief of control touch, then WHOA! Let me see what I can do about supplementing your belief, because if you fly long enough the situation will arrive when your deft handling of the controls will determine either life or death, completion or noncompletion of your mission.

I'm sure you are aware that "rattling the cyclic," besides producing an uncomfortable feeling for crew and passengers, requires more power to keep the helicopter airborne. In a situation where gross weight and density altitude are not factors, there is no immediate danger; however, don't form two types of flying. By this I mean sloppy or cyclic rattling flying in the above situation and then turning to serious or polished flying when gross weight and density altitude are factors.

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My reasoning is simply this: the time will come when a sloppy situation will quickly change to a serious situation, yet you might very well forget to switch habits commensurate with the situation. You can easily imagine the predicament you could find yourself in.

Have you ever tried to fly formation on some joker who flies as if he has ants in his pants? It's simply beyond his capability to maintain straight and level flight. This guy has two main problems: control touch and attentiveness. If you have flown with someone like this you know how much unnecessary work it causes you, as his wingman, to perform. If you haven't, you're in for an experience when you have this unfortunate opportunity.

You're carrying passengers now. All aboard—you clear left, right and overhead—ready to go. You ease the ole bird off the ground maintaining directional control and guide her right on into a takeoff, all real smooth, no yaw, no bump. Your passengers lean back, let out a sigh and say to themselves, "Real fine. This guy knows what he's doing; no sweat on this flight." You have just imparted a sense of high professionalism.

In a parallel situation you jerk the aircraft off the ground, allow it to yaw wildly, drop the nose excessively and blast off. What kind of a sense have you imparted this time? It certainly isn't a favorable one; and think of the jeopardy in which you placed your crew and passengers. No matter how smooth the remainder of your flight may be, remembrance of this intial takeoff will linger in the minds of your passengers.

Now you're on a medical evacuation mission. You must evacuate a lot of seriously wounded men who require immediate extensive medical treatment. With your cyclic rattling flying, you finally take off with as many on board as possible (you are not at max gross and you do have additional space available). On your return pickup trip you are informed that one of the wounded just died. You say to yourself, "If I could have taken him on the first trip, he might have survived. Well, they were all seriously wounded and I couldn't take any more than I did."

Let's analyze this situation. If your control touch was pretty rough, you probably did take off with all you could carry. Now take the Huey, for example: one psi torque is worth 200 pounds of lift capability. If your control touch was rough enough to cause you to use power beyond that required (through use of a smooth control touch) to take off, you can clearly see where you fell down on the job. If you had been smooth on the controls, it's possible that you could have taken one additional person on the first trip, and probably saved a life. Of course, the magnitude of a situation such as this would depend upon just how good or bad your control touch was; however, you can readily see how easy it is to lose or gain a few pounds of torque through your control touch.

Almost anyone capable of flying a helicopter can jerk it around, but not everyone who can fly it possesses an exceptional control touch. Exceptional—that's right, I said exceptional. We Army Aviators have access to more fine helicopters than do any other people in the world, so why not set our standards accordingly.

One might say that some people just naturally possess an exceptional control touch. For others, it's a long, hard uphill climb to achieve this goal. Whichever the case, let's start developing and maintaining this control touch commensurate with our professional flying ability. During the conduct of daily missions make all your takeoffs and landings with great precision; see if you can perform each maneuver safely, with minimum power. Work to improve your attentiveness also. While cruising, pick an altitude and airspeed and concentrate on maintaining both. Think ahead. Always use smooth, minute and accurate control movements.

You know, next to love, help is the most beautiful word in the English language. Make use of it. Don't hesitate to ask someone to help you in developing your "exceptional control touch."

Museum Seeks Historical Items

THE U.S. ARMY Aviation Museum at Ft Rucker, Ala., now is under the direction of a full-time civilian curator who is anxious to receive material significant to the history of Army aviation.

Many of us have items of importance to the history packed away in footlockers. Others often watch a significant document or piece of hardware destroyed without thinking that it should be saved for the museum. *Anyone* is authorized to contact the museum curator about donating or lending items of interest such as photos, maps, or even aircraft from any area—especially Vietnam.

Those interested should contact the Curator, U. S. Army Aviation Museum, Ft Rucker, Ala., 36360 (telephone extension 4507) before shipping items.

The Role of Army Aviation in

NATION BUILDING

Lieutenant Colonel Dillon Snell

ARMY AVIATION is certainly the rising star in the Army's galaxy of new concepts, doctrine, hardware and even basic missions. A look at the expanded role of aviation in Vietnam, the organization of a dramatic new airmobile division built around Army aircraft, the vast increase of aviation training facilities, and even the recommissioning of a World War II seaplane tender to support maintenance functions are all evidence of the increasing importance of Army aviation.

Army aviation detachments are located at all large headquarters. Most posts and literally thousands of units have aviators and aircraft. Service colleges, some Army attaches, MAAGs, and mapping detachments all boast at least one Army aircraft with a pilot who wears the wings of the Army Aviator.

There is one area, however, in which Army aviation is not well represented. In many of the developing countries where the U. S. military effort is used in "nation building" the full potential of Army aviation is not being exploited.

According to the Army's "Handbook on Counterinsurgency," nation building has the

> objective of increasing the viability of a nation through effecting programs of economic betterment, and social progress through such activities as engineering construction, transportation and communications improvements, including roads, railroads, bridges, telecommunications facilities, airfields and port facilities. . . .[1]

Furthermore, the U. S. Army's role in nation building is important enough to be described as the "third principle mission" of the U. S. Army, according to Chief of Staff, General Harold K. Johnson.[2]

Army aviation can assist greatly in this new mission of the Army. This article, therefore, investigates the possibilities for Army aviation to assist selected emerging countries in the building of their nations. It will address the nonfighting role of Army aviation, i.e., transport and associated operations.

As a vehicle for discussion, a potential insurgency situation in Ruritania, a fictional country, will be developed. It will then be shown how Army aviation resources can be applied to this low intensity conflict[3] situation.

RURITANIA'S PROBLEMS

Our present economic assistance program is modest in Ruritania; our military effort is nil. Ruritania has the typical problems of most developing countries: divisive tendencies of ethnic groups, inexperienced leadership with little popular political support, lack of adequate communications to extend the influence of the federal government to the rural areas, an urgent need for all

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[1] *U. S. Dept of Army, Field Manual 31-73:* Handbook on Counterinsurgency, p. 180.

[2] Gen Harold K. Johnson, "The Army's Role in Nation Building and Preserving Security," *Army Information Digest,* Nov 1965, p. 6.

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NATION BUILDING

sorts of development projects, a drastic disintegration of society caused by migration from the farms to the cities, a demand for higher standards of living, and painfully slow steps towards industrialization. All these frustrations have been generated by the rising expectations of independence.

A PROPOSAL

A United States military grant aid program could be offered to Ruritania, with emphasis on the use of Army aviation as a unifying force in nation building. Specifically, Army aviation could be introduced to support a modest local airline. This airline would project itself into the remote areas of Ruritania, and have a prime mission to carry the flag to the hinterlands. Its routine operation would be tariff-producing (probably heavily subsidized). It would haul passengers and cargo between the cities located along the rail line and the remote areas of Ruritania. To accompany the airline's progress there necessarily would have to be an intrastructure of radio stations, weather reporting stations, modest terminals with freight and passenger capability and, of course, simple airstrips minimally adequate to support modest performance aircraft.

A small fleet of the aircraft currently in Army aviation's inventory would be adequate, such as the U-1A, U-6A, and OV-1.[4] Their capacity for rough field service, rugged dependability, and ease of maintenance would be ideal for the Ruritanian National Airlines. The aircraft would be painted with the national colors, and a distinctive Ruritanian symbol would be displayed. Indigenous pilots and crews would be used as soon as practical. Passenger and cargo rates would be low. The cargo would be low density, high cost items for use in trade, with a view towards building up a segment of Ruritania's middle management establishment and increasing the standard of living. Other than the conduct of routine cargo and passenger lift, the modest fleet would be available to:

• *Transport federal government officials to remote areas.* This use would serve to identify the leaders in the capital with the federal government, and would facilitate exchange of information between local leaders and federal authorities. This mobility and exposure of federal officials would hopefully build up a national following, as opposed to the tribal following which limits many of the leader's effectiveness.

• *Carry federal military units to local ceremonies.* The Ruritanians, like most people in developing nations, consider pageantry and display to be important. A colorful band, drill team, or display of military equipment subtly should impress upon the tribes that the Ruritanian government has a potential capability to enforce its laws. This realization would increase the prestige of the federal army.

• *Transport selected athletic teams to important intersectional*

[3]Low intensity warfare is defined as operations involving U. S. advice and combat support for indigenous or allied forces engaged in establishing, regaining, or maintaining control of land areas threatened by guerrilla action, revolution, subversion, or other tactics aimed at internal seizure of power. (USCDC study "Concepts and General Doctrine for Counterinsurgency," Sep 1965, p. 3.)

[4]Although specific items of hardware are not important to this discussion, the Army's fleet of aircraft offer advantages in ease of maintenance, short and rough field capability and rugged characteristics. More sophisticated aircraft, including the new small jets and even the old venerable C-47, are often much too sophisticated and costly for the developing nations.

events. Regional and tribal athletic contests should be encouraged as a method of releasing tribal tensions. Ruritania is proud of its athletes, especially its track stars. This national pride should be capitalized upon and encouraged.

• *Missions of mercy.* An obvious role for Army aviation aircraft would be as ambulances for critical cases. Criticality may not depend on the severity of the illness, but rather on the tribal position of the ill.

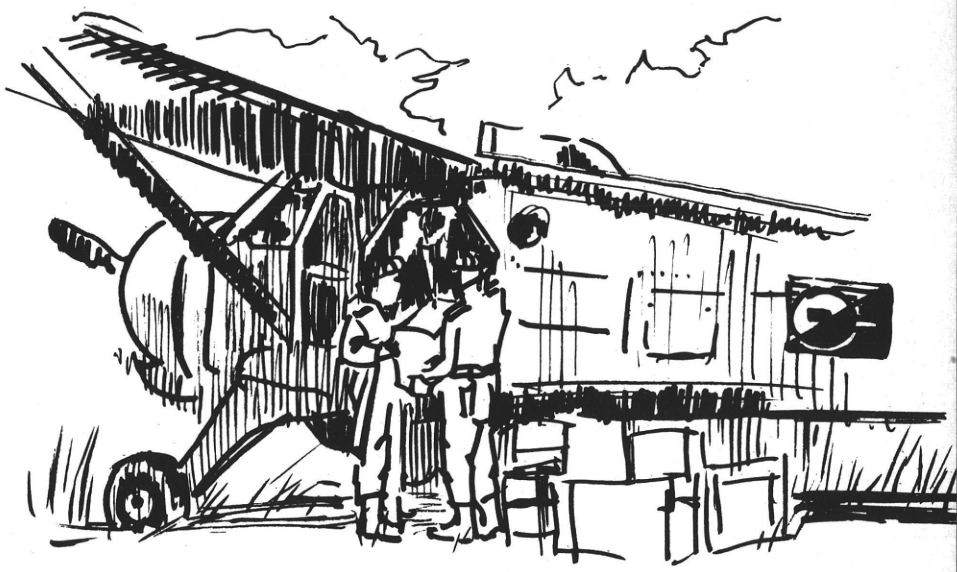
• *Assistance to agriculture.* Crop spraying, surveys, population counts of herds, wild animal surveillance for the benefit of the hunting tribes, also should be considered.

• *Aerial photography and mappings.* Of major importance now, and of vital interest in the years ahead, will be the photography and mapping of critical security areas (access routes, rail lines, bridges, etc.). Photography also has a use in agriculture and in the planning of new roads and rail lines.

• *Surveillance and potential trouble areas.* Communism and Friendlian borders. Special air patrols could cover critical areas along borders and be used to aid in population control in dissident areas which support the insurgent army, or the terrorist organization.

• *Troop movements.* Movement of government troops to remote areas either on peaceful missions of parade and display, or missions to maintain internal security.

A small detachment of helicopters could perform many of the aforementioned tasks and also assist in projects by capitalizing on their unique capabilities of being able to fly into areas with no prepared landing site. The cost and expensive maintenance of helicopters should be recognized in assigning these aircraft to Ruritania; however, they are versatile and could be used for:



Transporting freight is one of the most important contributions

• *Placement of telecommunication facilities in remote areas* to aid in establishing control and communication facilities throughout Ruritania. Perhaps flying TV stations, similar to those in use in Vietnam, would eventually be feasible.

• *Provision of intensive patrolling or surveillance over* especially critical areas: pipelines, bridges, railroads, sites of border crossings, etc.

The purpose of this Army aviation effort would be to aid in unifying the country by making tribes and individuals in the interior aware of the federal government's existence and efforts on their behalf. The airline should make every effort to display the symbol of the Ruritanian government in the hinterlands by works of mercy and delivery of goods which would raise the standard of living in remote areas. The visible presence of the aircraft, as well as the airfields, terminals, weather stations, and other support facilities, should focus attention on and extend the image and the governing capability of the federal authorities.

Of special importance is the assistance which the airline project would give to Ruritania in the training of aircrews, radio operators, weather experts, and a multitude of maintenance personnel. The training structure to support these skills should be more than adequate to train men to the needs of the airline. Commerce and industry should be encouraged to use these subsidized training facilities to improve the skill level of their employees.

Additionally the construction of airstrips and communication facilities, perhaps by Ruritanian Army units used in civic action roles, would increase the presence of the federal government in the hinterlands. It would offer employment and instruction in manual labor skills to local citizens, and would thereby have an economic impact on the local standard of living.

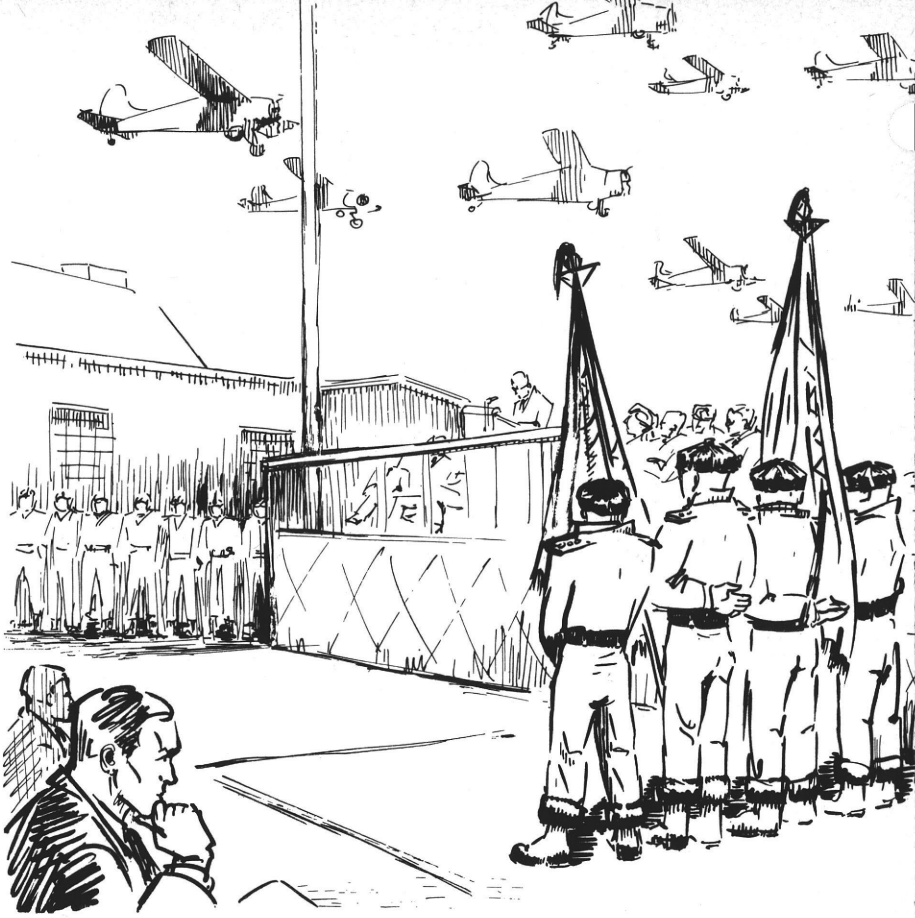
Certain objections to such a proposal are evident. Foremost are the real criticisms of cost and dissipation of assets. The cost

would be high and U. S. Army aviation resources are stretched to the limit at present in Vietnam. But in terms of alternatives—if there is a possibility of U. S. involvement in any large scale insurgency in Ruritania—the cost objection seems negligible. The money spent in one week by the United States in Vietnam would certainly more than underwrite the proposed program in Ruritania for years to come.

The use of perhaps 100 Army aviators and technicians would be a drain on Vietnam (and other priority requirements) but, in terms of prevention instead of war, Army aviation's contribution would be extremely worthwhile. A relatively modest effort now might preclude the epitaph of "too little, too late" which so often is used to epitomize our aid effort.

Another objection, and perhaps the most revealing one, from the developing nations' point of view, is that aggressive U. S. effort to aid Ruritania would bring charges of neo-colonialism, or aid-imperialism aimed at the United States. The Ruritanian government would be accused of supporting U. S. interests (staging areas, or bases for counterinsurgency effort) for aggressive purposes. This charge of neo-colonialism would have to be countered by a straight-forward announcement of U. S. intentions and an equally frank proclamation by Ruritania of its ready acceptance of this aid program.

A final objection to be considered is that the aid, whose primary goal is to unify the country and strengthen the incumbent government, would be supporting the status quo administration. In Ruritania or any other country, the incumbent administration might not be the one that would best strengthen U. S. prestige and advance programs for the dignity and well-being of the individual. Perhaps the only counter to this objection is to accept the pragmatic view that the Ruritanian government is as popularly supported and as good as any other government would be now or in the foreseeable future. Certainly a hard, realistic look at any government we support is necessary before we attempt to back it up and strengthen its power structure.



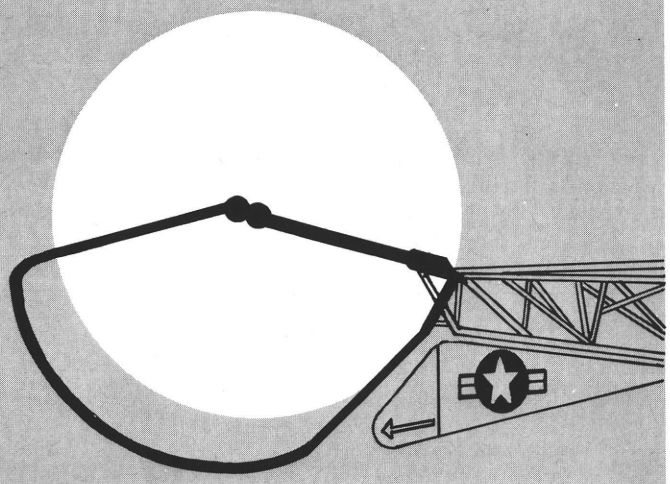
The aircraft play a major role supporting various local ceremonies

Alternatives to this proposal for strengthening an emerging nation's unity by use of Army aviation are to proceed in our time-honored way of developing capital projects, assisting by development loans, and giving aid to individuals and communities through the Peace Corps and AID's agricultural development assistance. These alternatives may not gain results fast enough to combat successfully Ruritania's latent insurgency problems.

The Army aviation program could be used in many countries which are plagued by tribalism and lack of communication to the interior. Any new country gains from a strong federal system. Developing countries would be strengthened and their pro-West outlook improved by the use of an air feeder line into remote areas. A successful model program in Ruritania could be used to expand similar activities into other countries.

Army aviation with its versatile capability can contribute greatly to the United States nation building program, the "third mission" of the U. S. Army. Support of a local feeder airline is a prime example of how Army aviation can enhance and strengthen a country's unity and increase its ability to counter internal subversion. If successful, such a program might prevent another Vietnam in the developing areas.

Collateral Investigation of Aircraft Accidents



Major Douglas T. Banks

ALL RIGHT, Chuck, hold your horses. Let's think this thing over. I know he's lost three aircraft in less than a year—all due to pilot error. But I don't like to throw the book at anyone until I know all the facts.—Walker! As soon as you're through come into my office and we'll kick this thing around a bit."

As soon as Captain Walker finished his phone calls he went into Colonel Smith's office. He got there just in time to hear Major Charles Brown say, "I think Major Jones and the other board members should go out there immediately and get right on this accident. They should make an extra copy of their accident report. We can use it as evidence in a flight evaluation board on Lieutenant Hamphill."

The surprise that registered on Captain Walker's face must have been pretty obvious because the colonel said, "It's sticking out all over, Walker. What's your objection?"

"We can't do that, sir."

"Oh! Why not?"

"Army aircraft accident investigation is privileged testimony. It can be used only for accident prevention and safety and can't be used as a basis for any administrative action."

"Are you sure?"

"Yes sir. That's what AR 95-30 says. Also it's one of the big points they kept hammering at us at the Army Aviation Command and Staff Officers Course at Fort Rucker. We got quite a good presentation on aircraft accident investigation and collateral investigation."

"What the devil is a collateral investigation?"

"That's the one you'll want in this case. It's a fact finding investigation. And you can use the

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Collateral Investigation of Aircraft Accidents

evidence you get from it for disciplinary and litigation purposes. You can even use it for fixing liability.

"You see in the aircraft accident safety investigation, testimony is usually not made under oath. The witness is assured that his testimony is privileged and will not be used for legal or disciplinary purposes. There are several reasons this is done this way. But an important one is that it allows the witness to talk freely and off the cuff.

"In a collateral investigation the witness is told that what he says may be used for legal purposes. He is advised of his rights under article 31 of the Uniform Code of Military Justice. The witness cannot be required to give information that could be used against him."

"Then you think we should appoint a collateral board in this case?"

"Yes sir. We'll have to if we are going to have material for use in any disciplinary action. The school said a collateral board should be convened when someone is permanently injured or killed. They also said this type board should be formed when the accident may lead to any kind of command prosecution, liability against military personnel, or when private property is damaged badly. And, of course, a commanding officer can call one when he feels it necessary."

"Well good," Major Brown broke in to say. "With your permission, sir, I'll get another set of orders published making Major Jones the president of the collateral board, too. That way we can kill two birds with one stone."

"Whoa, Major! You can't do that. People on the collateral board can't be on the investigation board. Fact is, nothing done by the investigation board can be used by the collateral board. Members of the collateral can't even attend the accident board proceedings."

"How about the accident board's findings and recommendations?" Major Brown asked.

"No sir. These can't be used either."

"Good grief!"

"How about pictures?" the colonel asked.

"Well there's the one exception. You can use the same photographs, but there can't be any accident investigation board information on them. Of course the same witnesses can be interrogated."

"When did all this come out?"

"Oh some time ago. But it didn't become effective until the first of last month (January 67). It's in the new AR 385-40."

"Well, sir," Major Brown said, "if we can't use Major Jones' people we'll have to get another group together. Since Captain Walker knows so much about it, I suggest we let him head it up. I'll get the orders cut. . . ."

"No, Chuck," the colonel cut in to say, "I don't want Captain Walker on this board."

"Well, who sir? We don't have many officers left."

"I'll need Captain Walker here to advise me on all this stuff. Put yourself on as head of the collateral board."

Portable Weather Station

A NEW PORTABLE meteorological measuring set, the AN/TMQ-22, is undergoing engineering evaluation tests at the U. S. Army Electronic Proving Ground, Fort Huachuca, Ariz. The set was developed by the Army's Atmospheric Sciences Laboratory.

The AN/TMQ-22, slightly larger than a standard attache case and weighing only 17 pounds, provides capabilities for measuring wind velocity and direction, temperature, dew point, barometric pressure, rainfall and snow depth.

These capabilities represent a significant improvement over older versions of similar equipment. The AN/TMQ-22 is designed to provide more information, better accuracy, easier operation, and faster data acquisition than equipment now in use.

This increased capability is achieved while, at the same time, reducing the size and weight by using electronic sensing devices to measure temperature and dew point, and by using more compact components for other functions.

Engine Missing

CW2 C. D. Holbrook

This brief headline doesn't tell the reader much and may be a source of irritation to him. It might also be a source of irritation to the maintenance man who finds the same words used in a hurried writeup on DA Form 2408-13.

THE MOST important form pertaining to aircraft in the using organization is the DA Form 2408-13. This small rectangular form contains a world of information which directly concerns the pilot, crewchief, maintenance officer, and Command Management Maintenance Inspection (CMMI) teams.

There have been numerous cases of this one form revealing enough information to fail a unit on a CMMI. The main area that needs much improvement is the manner in which we as pilots write faults of the aircraft on this form.

Pilots generally are very careful to check the log book before the first flight, but generally are very lax at the end of the flight. It requires much less time to write "FLT 1 OK" than write up the deficiencies of the aircraft. So minor deficiencies progressively get worse until the aircraft is finally grounded.

A prime example of a minor discrepancy which could cause undue damage to the aircraft is a slight lateral vibration in a helicopter. A slight lateral is usually not annoying to the average aviator, so consequently it will never be written up. The correction would be a weight added to the light blade (very simple operation). This type of vibration will seldom intensify with added hours, but every time the rotor makes one revolution the mast bearing is receiving undue wear. The transmission mounts are also working more than normal which will cut their life span.

The aircraft will probably fly until periodic inspection at which time the maintenance officer will catch the vibration. A close inspection will then reveal possible main mast bearing and transmission mount failure. Those items for a UH-1B cost $226, which could have been saved if one pilot had entered "slight one to one lateral vibration during all maneuvers" on the DA Form 2408-13.

A simple writeup will usually get some corrective action from the maintenance personnel but several dollars and manhours can be saved if the aviator will give a full description of the fault.

Prime examples of improper writeups which occur each and every day are as follows:

"UHF Radio Inop"
"Engine Missing"
"High Frequency"

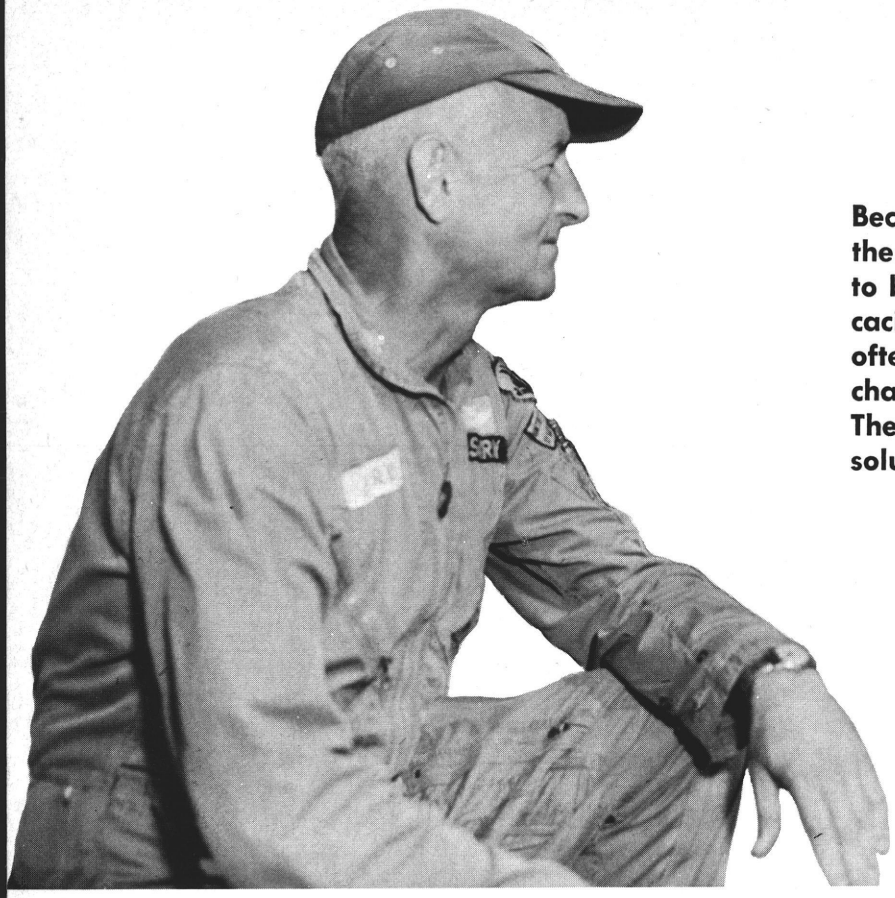
Actually the aviator meant to say the UHF radio will not transmit nor receive more than 5 miles from station. Avionics will be called, the radio will work beautifully sitting on the ramp, so they sign the writeup off "Ground checked OK." The same writeup will appear after the next flight. In most cases the crewchief will be able to explain the pilot's writeup if he flew with the aircraft, but we can't always depend on him for such vital information.

"Engine missing" could mean several different discrepancies depending on who entered the writeup and who is making the interpretation. In all probability the aviator was trying to say the engine had a rapid X number of rpm drop on the left or right magneto. If he had written it up this way almost any mechanic would be able to pull the fouled plug without any further troubleshooting.

"High frequency" actually tells the maintenance personnel nothing except the aircraft is grounded until a test flight can be performed. All that is required to give the mechanic a starting point is an autorotation before landing. Say the high frequency disappears during autorotation and the mechanic will probably find a bent or missing fan blade or maybe a dirty fan. Say the high frequency remains and he will find his trouble in the tail rotor or tail rotor drive train. Depending on his experience, he could probably go directly to the faulty item if he only had an idea of where to start.

These examples are only a few of the aviators' errors pertaining to maintenance management. You aviators are as important to the maintenance management chain of command as national maintenance point itself, so let's all try to work together for a better system.

CW2 Holbrook is an instructor, Dept of Maintenance Training, Ft Rucker, Ala.



Because of the nature of his title, the instrument examiner is expected to be the unit's expert on the intricacies of instrument flight. But too often he is not made aware of changes to rules and procedures. The author offers a few suggested solutions to this problem.

Captain Gary V. Dennison

The Man Who Doesn't Know — But Should

THE ARMY AVIATOR (who seems to be moving around a lot lately) is well aware of the state of flux of the flight information distribution system and the changes it has created. CONUS aviators have been using the new flight manuals for some time while USAREUR aviators are still in transition to the FLIP. Similar evolvements are occurring elsewhere.

The man most directly interested in changes to rules and procedures, particularly as they apply to IFR flying, is normally the instrument examiner. By the nature of his title, he is expected to be the unit "expert" on the intricacies of instrument flight. Yet, sometimes the expert himself is not made aware of changes in rules and procedures.

A stateside examiner has relatively few problems in keeping current on air traffic control procedures due to the ready availability of the nearby FAA office and other resources. However, for the examiner stationed at a remote airfield overseas, this information is not as easy to obtain.

Under the present distribution system each examiner and Army Aviator receives current flight information for the area of the world in which he is stationed. This data varies between locales but basically is of two types: those procedures used under the auspices of the International Civil Aeronautics Authority, and the usually more well-defined rules for operation of aircraft in CONUS.

The examiner is expected to bridge the gap between these two sets or variances of rules. Regardless of the area of his overseas assignment, he is the one who is constantly asked questions as to

CPT Dennison was Executive Officer, Aviation Company, 3rd Armored Cavalry Regiment, APO U. S. Forces 09034, when he wrote this article.

the application of local instrument procedures in relation to similar procedures in CONUS. Normally the only information readily available to him is the former years' Army Aviation Annual Written Study Guide which, at best, is only current as of the date it was sent to the publisher.

As a result the examiner and other aviators overseas discover that they have been discussing, and more than likely practicing, obsolete procedures. To a man truly interested in the fine points of his profession this is a disheartening experience and adds to the increasing complexity of the business.

One answer for the examiner might be to call his nearest examining board, but this becomes difficult when the newly published AR 95-63 deletes all mention of examining boards. As of this writing, the future of Army examining boards appears limited. However, if the board does exists, the problem is still one of communication. As a result, many small questions go unanswered. The aviator wants an answer when he asks the question. Failure to provide him an immediate response violates the rules of educational psychology.

Another answer is that the commander has the "responsibility" to provide all needed information and to answer questions. But is it the commander who teaches annual writ preparatory classes? More than likely it is the examiner, and he NEEDS TO KNOW.

One examiner in Germany went to great pains to research and test fly an instrument course of such a routing that, without exception, the flight could be made using FAA rules without any infringement on ICAO procedures or criteria. He had a similar course slanted to ICAO rules, but the CONUS route was

Examiners need current information

particularly used a great deal to prepare aviators of his unit for the annual written exam, as a comparison between the two systems, and as a refresher for aviators rotating to CONUS. He was somewhat disgusted to learn a year later that many of his teaching points were no longer valid.

The examiner—that "decider" of discussions—needs current information.

One way he can get it is to send money to the FAA and purchase the necessary Federal Air Regulations and hope that he will be kept on the change distribution list. Such action, however, hardly adds to the professionalism of Army aviation.

Another way is to have examiners, worldwide, on a separate distribution list for issue of those flight information publications and changes which deal directly with instrument flying. To preclude the high cost of this system some rules would be necessary. Not all examiners are active. If distribution were limited to those actually working as examiners and those who specially requested this service, costs could be reduced.

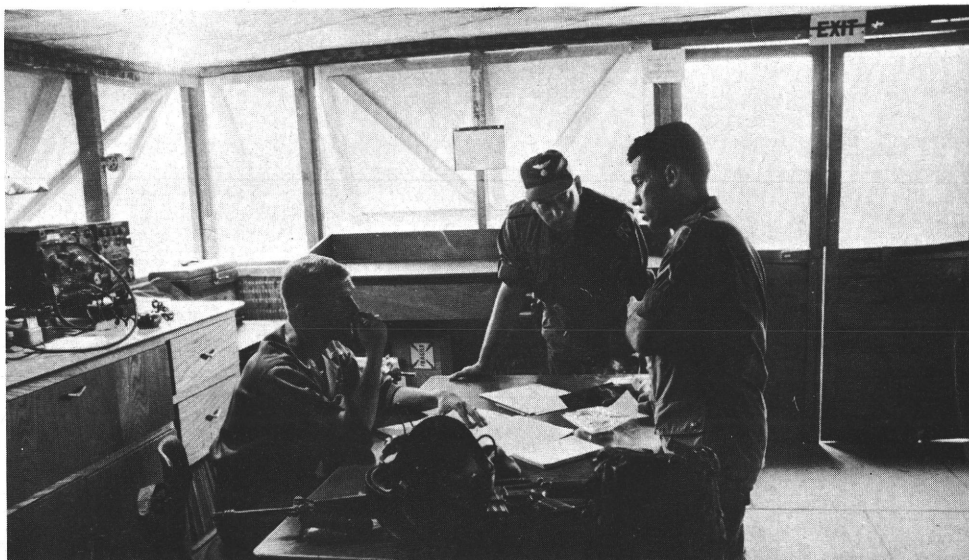
Further savings and standardization could be maintained if this distribution list were maintained at Fort Rucker. Coordination and close contact with the home of aviation would thus be enhanced. An occasional newsletter attached to the ATC changes sent out would be another assistance. The USAREUR Newsletter, formerly issued to aviators in Europe with their Jepp changes, was an excellent example of getting the word to people who needed to know. This newsletter was discontinued due to costs. However, a simple mimeographed sheet sent to a few selected individuals does not compare to a multipaged, lithographed letter to hundreds of aviators.

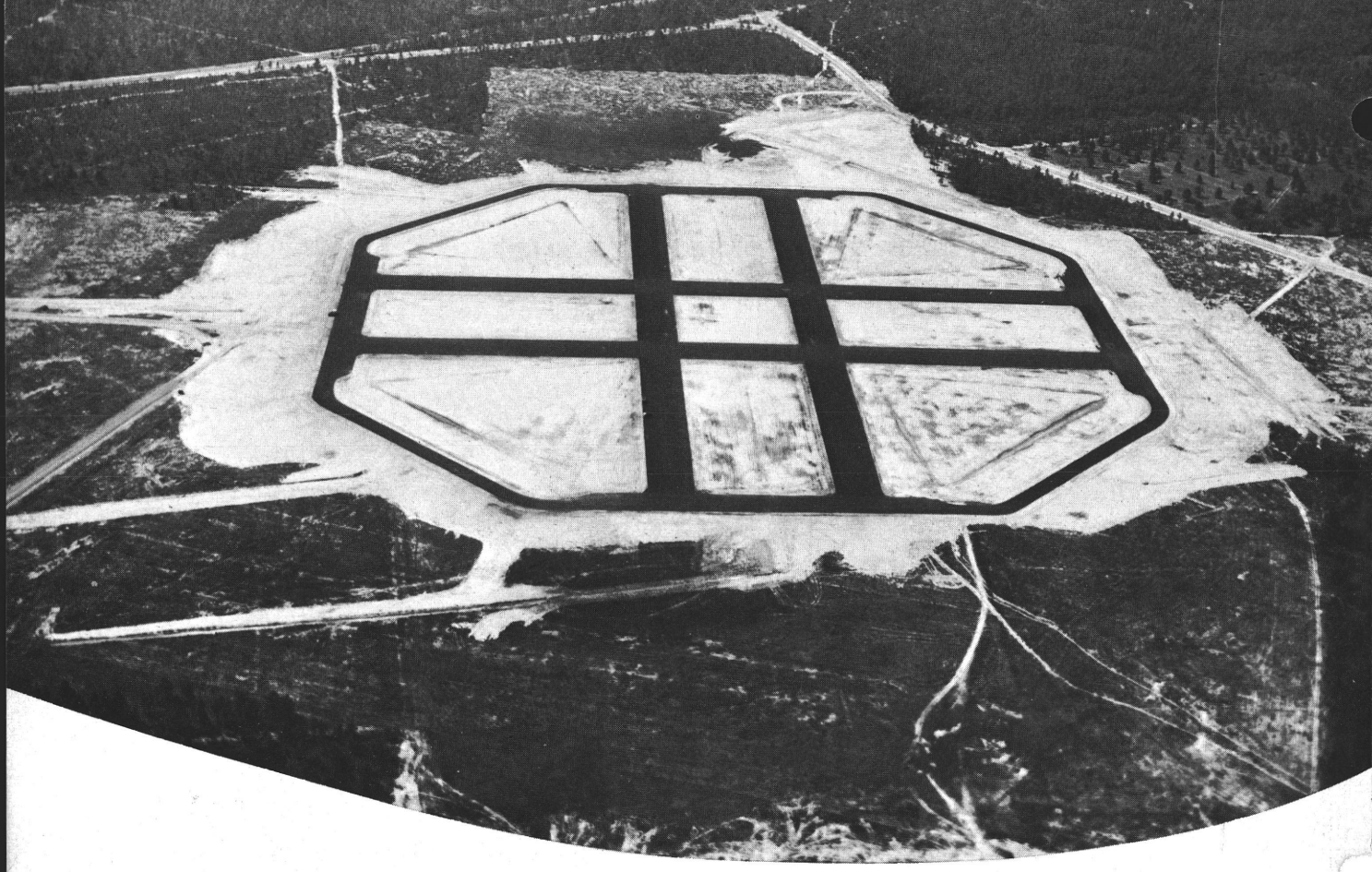
The success of such a distribution list would also depend upon the individual examiner. He would have to fully understand his obligation to spread the word. Examiners, in general, are cognizant of this requirement.

Due to the increasing complexity of air rules, the rate at which they change, the wide distribution of aviators and the recent abolition of examining boards, the instrument examiner is an important asset to Army aviation with increased responsibilities in the furtherance of instrument flying.

Let's give him the tools to do the best job he can. Let's make sure that the man who should know, does know.

Some examiners are located at remote overseas airfields





A NEST OF REBELS

THIS HOUSE WAS the home of a nest of Rebels."

These were the words that Revolutionary War hero General Daniel Stewart found burned into the walls of his Georgia plantation home when he returned after the revolution was over.

It might well be that Fort Stewart, Ga., which is named for General Stewart, houses another nest of "Rebels" now that the U. S. Army Aviation School Element has moved there. These new "Rebels" are busy rebelling against the old, slow method of getting from here to there, and insist on doing it a new and quicker way.

When the sky over Fort Rucker, Ala., became overcrowded it was necessary to move part of the Army's aviation training. Fort Stewart was recommended as the spot to train the Initial Entry Fixed Wing students because it is suitable in so many ways. Among these are:

• Large land area. Fort Stewart has 280,000 acres or 438 square miles of available land area.

• Airspace. Very little use was made of the airspace over Fort Stewart by civilian and military aircraft.

• Available facilities. Good facilities were available at Fort Stewart, and many were not being used to full capacity by ground units already stationed there.

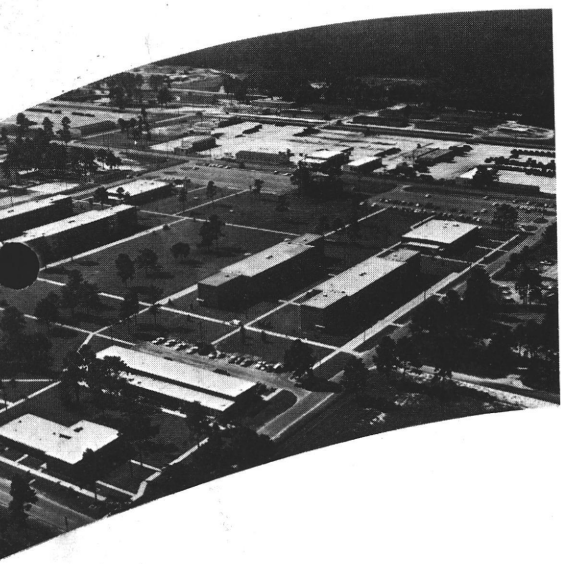
• Good flying weather. The overall weather at Stewart is almost as good as that at Fort Rucker. As a matter of fact, Fort Rucker climatology reports were used in surveying Fort Stewart.

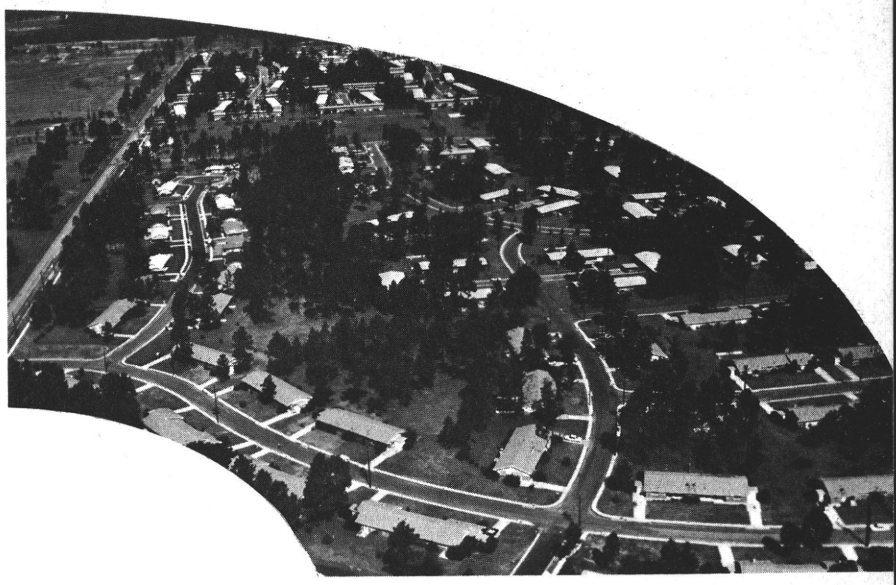
• Fort Stewart is near Fort Rucker. Since the Aviation School Element depends on the parent organization at Fort Rucker for much of its support, it is necessary that it be near Fort Rucker. Most Army aircraft can fly round trip without refueling.

Of course, Fort Stewart is not perfect; no facility ever is. Fort Stewart's big problem is its lack of dependent housing for both military and civilian. The area around Fort Stewart does not have enough civilian housing at this time to take care of an overflow of military and civilian families connected with the Aviation School Element. Hinesville, Midway, Richmond Hill, and the other small towns in Liberty County have few available houses. At this time the personnel buildup is not complete. Already some families of both permanent party and civilian personnel as well as students must live in Savannah, Ga., which is 40 miles away.

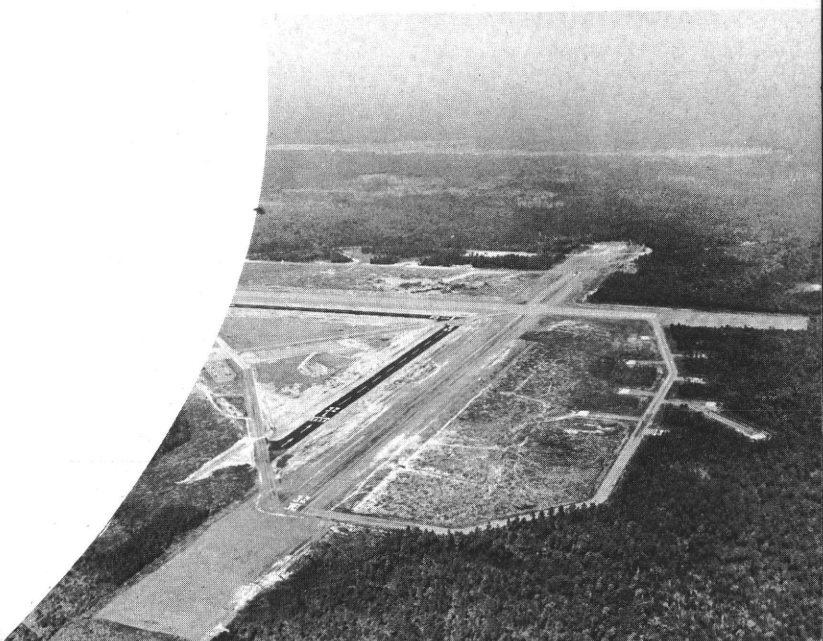
At an open forum regarding the phase-in of the Aviation School Element, civilians in the local area were told that approximately 4,000 persons would move into the area in the next 12 months. This figure represents the trainees and their families, as well as training, maintenance, and other personnel.

Of course, with the kind of money the School Element brings into the area, this situation can change quickly. With the School Element on post, the military payroll at Fort Stewart is now about $18 million a year. Operation and maintenance programs involve spending more than $13 million in the next year. The civilian





Upper left: The "tick-tack-toe" primary stagefield at Fort Stewart
Left: A student on the flight line
Above: Troop command and warrant officer candidate billets
Upper right: Family housing area
Right: The renovated Liberty Army Airfield



A Nest of Rebels

payroll has increased to more than $6 million, and nonappropriated fund personnel will be paid about $300,000 in the next year. Before all the construction projects to support the Aviation School are completed, Army Engineers expect to spend over $.9 million.

MOVING THE SCHOOL

Plans to move A and B phases (Primary and Advanced) of the Initial Entry Fixed Wing Program, the Fixed Wing Qualification Course, the Fixed Wing National Guard and IP Course, and the UH-1 IP Gunnery Course to Fort Stewart were approved by the Department of Army in February 1966. Shortly after the move was approved, the advance party moved to Fort Stewart and started setting up the school.

Detailed plans had already been made and it was only a matter of setting these plans into motion. The school is a self-sufficient unit with its own internal administrative support. However, requisition of personnel is accomplished through the G-1 at Fort Rucker. Logistical support, as far as possible, is furnished by Fort Stewart, in accordance with a host-tenant agreement.

Civilian contractors furnish the support Fort Stewart is not equipped to handle. A fixed wing contractor is responsible for primary phase A training and a maintenance contractor keeps the aircraft flying. Ross Aviation, Inc., has the contract for primary phase A training and repair work is by Page Aircraft Maintenance, Inc. Both of these contracts are extensions of present contracts in force at Fort Rucker.

PERSONNEL

Original plans called for the school to be manned by 90 officers and warrant officers, 166 enlisted men and 93 civilians. This did not include contractor personnel. Later, however, a more realistic manning table of 83 officers and warrant officers, 162 enlisted men, and 102 civilians was decided upon. The new manning table reduced the number of military personnel by replacing them with civilians, and adding civilian spaces where needed.

CONSTRUCTION OF ADDITIONAL FACILITIES

Even though existing facilities were good, a considerable amount of renovating had to be done to equip Fort Stewart to house the new school. All acquisition of additional facilities was conducted by the Savannah District Engineers.

Liberty Army Airfield (LAAF) needed considerable renovating. LAAF is the main field used by the students and is under operational control of the school. Two parallel runways, a parking ramp for rotary wing aircraft, tie-downs for fixed wing aircraft, and two aircraft wash racks have been installed.

A portion of a new hangar at LAAF was modified to house the Air Force Weather Detachment and its equipment, and an additional nondirectional beacon to provide IFR separation from the restricted area was installed.

Also, a 5,000 square foot extension to an existing hangar was constructed and the control tower was renovated to enable it to handle 600 daily operations.

CLASSROOMS AND BRIEFING ROOMS

No new buildings were constructed to house the classrooms and briefing rooms needed by the school. Six temporary buildings of World War II type were rehabilitated to furnish eight 36-man classrooms. Eight wooden mess halls and one other small temporary building were moved to LAAF to be used as briefing rooms and office space for instructors and maintenance supervisors, as well as working areas for other personnel.

STAGE AND OTHER FIELDS

The Fort Stewart "Rebels" have three stagefields. A primary stagefield has been built in the southwestern portion of the reservation. A circular field used as a DZ by the Air Force was already there, and two parallel runways were constructed in a tick-tack-toe configuration. A full advanced stagefield consisting of two parallel Z runways with parking area was built in the northwestern corner of the post. The third stagefield is midway between the other two fields and has one runway and an aircraft parking area. In addition, 30 offpost field strips have been leased and ten road strips have been improved for use in training.

MEDICAL FACILITIES

When one of the Fort Stewart "Rebels" runs into trouble he'll get good medical treatment. The hospital has been augmented by an Aviation Medical Dispensary which can take care of just about any trouble that may occur in the field of aeromedical attention. The dispensary is serviced by two flight surgeons.

A helicopter aeromedical evacuation section operates two UH-1D evacuation helicopters. The two helicopters are equipped with 600 pound hoists for use in areas where the helicopter can't land. The UH-1Ds have a range of 200 miles and can cover the entire area used by students at the school.

The med evac section has four pilots (two commissioned officers and two warrant officers), two medical assistant E-5s, and four firefighters.

Maintenance is performed by a civilian contractor

THE FLIGHT TRAINING PROGRAM

Initial Entry Fixed Wing students receive 16 weeks of training at Fort Stewart and 16 weeks at Fort Rucker. This is three weeks less than the student used to get at Fort Rucker. An analysis of the instruction was made before the School Element moved to Stewart and it was found that the training time could be shortened with little effect on the quality of instruction retained.

The student receives eight weeks of primary flight training by the civilian contract instructors, and eight weeks of advanced instruction by military and Civil Service instructors. Both phases are conducted at Fort Stewart.

An off-the-shelf aircraft, the T-41B (Cessna aircraft model 172), is used for training. The Army Aviation Materiel Command has awarded the Cessna Aircraft Corporation a contract for 255 of these airplanes and has an option for 90 more.

When all are delivered more than 100 will be assigned to the Army Aviation School and Center, and the remainder will be at Army posts in the Continental United States.

After completing A and B phases the student will go to Fort Rucker where he will receive eight weeks of twin engine and instrument training from civilian contract instructors in another off-the-shelf trainer, the T-42 Beech Baron. This will be followed by four weeks of transition training in the O-1 Bird Dog and four weeks of tactical training, again using the O-1.

The O-1 is used in this final training so that the student completes his tactical training in the type aircraft he will probably fly in Vietnam. He completes a course of instruction based on the latest lessons learned from combat.

THE FIRST CLASSES

The first aviation training class at the new school was a Fixed Wing Qualification Course. Eight officers and warrant officers of the active Army and National Guard began training in the operation of fixed wing aircraft on 5 July 1966.

They learned general fixed wing flight subjects, maintenance, short-field and road strip landings and takeoffs, night flying, formation flying, and advanced military operations.

At the same time, three National Guard fixed wing pilots took a 20-hour standardization course. Purpose of this course is to help standardize the method of training within the Army, Army Reserve, and the National Guard by qualifying instructor pilots.

The first Initial Entry Fixed Wing students started classes on 8 August. The class consisted of 33 warrant officer candidates and 22 student officers. Every four weeks thereafter a new class of 55 students has arrived for training. Four classes are in residence at all times.

THE FUTURE OF FORT STEWART

It is pretty evident that out of pure necessity, aviation training at Fort Stewart will have to increase if the demand for aviators continues. The sky and land area at Fort Rucker are already overcrowded. One FAA official jokingly said that there seemed to be more helicopters flying over Fort Rucker than automobiles on the ground.

If things at Fort Rucker are as crowded as is reported, then where will the Army find room to train aviators with the new HueyCobras and AAFSS? The most crying need is for gunnery ranges for the new aircraft. Fort Rucker does not have range land available. Fort Stewart does. So it may be that the HueyCobra and AAFSS transition schools will be located at Fort Stewart.

On the other hand, should the Vietnam conflict suddenly end, the Army may find that it can reduce the number of aviators entering the Army aviation program. If this is done, it may be more economical to move the Fixed Wing School back to Fort Rucker.

As it now stands, however, the Fort Stewart "Rebels" are well settled in their new home, and are happy with things as they are.

crash sense

the following 28 pages prepared by the United States Army Board for Aviation Accident Research

The Case for Close Supervision Evaluation Standardization

FLIGHT SURGEONS and psychiatrists tell us that people, including aviators, tend to revert to established habit patterns during moments of stress. They say that our subconscious minds are programmed by these habit patterns, and our reactions under stress, or when our conscious minds are distracted, are governed by the habits we have developed through training and experience.

Have you ever driven along a familiar road and suddenly realized you had gone for several miles without consciously seeing any landmarks? Chances are your conscious mind was totally absorbed with thoughts of promotion, a blonde, or your Aunt Sally's operation; or any of hundreds of items that can and do take over and dominate our thoughts and conscious attention. When this happens, we are driving by habit and our reactions to road hazards will be programmed by the habits we have developed through driver training and experience.

Habit patterns can be beneficial when developed with desired reactions. Soldiers training for combat are put through their paces repeatedly to develop instantaneous, habitual, and correct reactions to commands and combat situations. Their habit patterns are programmed for desired reactions under the stresses and distractions they will face in combat. The same is true for fledgling aviators whose habit patterns are programmed for successfully coping with inflight emergencies.

Habit patterns can also be damaging and expensive—

CASE HISTORY NUMBER ONE

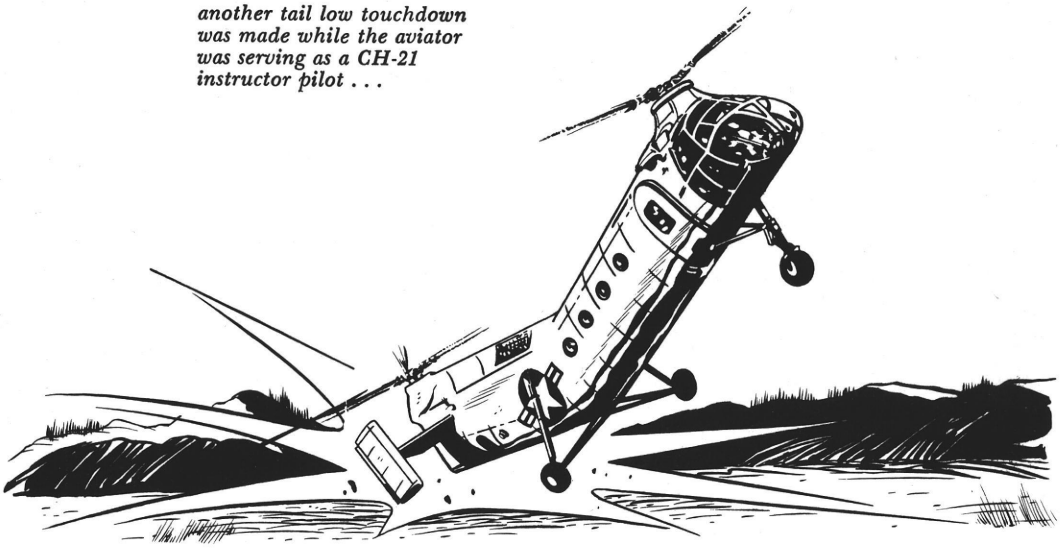
Two months out of flying school, a rotary wing aviator was practicing touchdown autorotations in an OH-13. He made a straight-in approach, flared, and *landed tail low*. The aircraft rocked forward and a main rotor blade sliced through the tail boom. Damages to the helicopter totaled $11,097.

This aviator became a CH-21 instructor pilot and was serving in this capacity, again practicing autorotations, when another *tail low touchdown* was made, causing minor damage to the tail cone. Cost figures for this accident are not available.

After accumulating 1,788 flying hours, this aviator became a UH-1 IP and was conducting transition training in a UH-1A, again practicing autorotations. The autorotation was started at 500 feet and 70 knots. The pilot slowed to 50 knots during the descent and made a moderate flare at approximately 100 feet. At about 12 feet above the ground, while still in a flare attitude, he began applying pitch to slow the rate of descent. At this point, the IP, realizing that a *tail low hard landing* was

one aviator had five major accidents with damages totaling $475,097 . . . averaging $53,788 per year or $180 per flying hour . . .

another tail low touchdown was made while the aviator was serving as a CH-21 instructor pilot . . .



coming, grasped the controls. He applied additional collective, but the helicopter landed hard in a tail low attitude. It bounced up and forward, the toe of the left skid scraping the ground. On the second impact, the UH-1A touched down nearly level with no forward speed but began to roll to the left. While in a tilted attitude, it yawed to the right 50° and settled back on both skids. Both main rotor blades struck the tail boom forward of the 42° gear box, severing the tail rotor drive shaft and pitch control cables, and partially severing the tail boom. Damages totaled $31,000. The accident report stated that a power recovery was not considered nor attempted at any time during the approach.

Two months later, again acting as a UH-1A IP and giving transition training, and again practicing autorotations, this aviator was involved in another major accident, *caused by a tail low touchdown attitude.* Again, damages to the aircraft totaled $31,000.

This aviator accumulated 2,400 total flying hours, was qualified in CH-47As, and was flying in support of a field training exercise. He made a tactical type airspeed over altitude takeoff, cleared the trees on the side of the helipad, and leveled off approximately 25 feet above the trees. He then made a steep 90° turn to the left. At this point, his attention was directed inside the cockpit while he changed the position of the transmitter selector switch. As he looked back up, he saw trees directly ahead at eye level and applied aft cyclic. The aft rotor struck a treetop approximately 4 inches in diameter. The aircraft began to vibrate severely and he landed in the first available area. As he shut down, the aft rotor blades struck the fuselage because the droop stops had been knocked off by impact with the tree. Damages to the helicopter totaled $371,000.

This aviator continued to fly CH-47As. He was assigned an administrative mission to move a unit's equipment and personnel from one area to another. After the cargo and passengers were loaded, he lifted off and hovered at 5 feet for two minutes, waiting for tower clearance. As he started forward, he noticed a drop in rpm and asked his copilot to increase beep. The rpm continued to fall to 220. He turned to the left to reach level terrain and made a modified running approach. The aft gear hit first in a small creek and the helicopter bounced and skidded 100 yards to a stop. Damages totaled $31,000. During the investigation, it was found that the helicopter had been overloaded by 1,665 pounds above maximum allowable gross weight. The accident investigation board stated that there was ample time available for the pilots and crew to accurately determine the weight of their cargo and passengers.

During nine years of flying, this aviator had five major accidents with damages totaling $475,097. His accident costs averaged $53,788 per year or $180 per flying hour.

CASE HISTORY NUMBER TWO

A fixed wing aviator with 1,321 flying hours was making a barrier approach in an O-1A. The aircraft stalled over the barrier, landed hard, and spread the gear. It bounced twice, veered left, and hit the third time on the right wing. Major damage to the landing gear, wing, propeller, cowling, and internal bulkheads cost $1,890.

His second accident came in a U-1A while he was serving as IP for a training flight. The pilot made his takeoff, reduced flaps from takeoff to climb setting, and was preparing to reduce flaps to cruise at 100-150 feet. The IP closed the throttle for a simulated forced landing and the pilot immediately went forward with the control yoke, but stopped before he had applied enough forward pressure to maintain flying speed. The airspeed began to dissipate and the aircraft entered a high rate of descent. At 50-70 feet, the IP took control, added power, and lowered the nose in an attempt to regain flying speed. Minimum flying speed was regained, but the IP was forced to abruptly pull the yoke rearward due to the low altitude at which he recovered to keep from hitting the ground nose low. This abrupt movement caused a stall. The U-1A hit the ground in a right crab, left wing low attitude, bounced, and slid to a stop. Damages totaled $3,009.

The aviator built up 283 hours of rotary wing flying time and was flying a UH-1B on a support mission. He was on his way back to the home field to refuel when the fuel warning light came on. Although another airfield was nearby, he attempted to continue to his home field and exhausted the fuel. He autorotated to a flat, plowed field, but touched down on a ridge, shearing the skids. The main rotor severed the tail boom. Damages to this aircraft totaled $28,479.

Two years later this aviator was taking off from a 1,800 foot strip in a U-6A with four passengers aboard. The Beaver became airborne approximately one-third the way down the strip, was airborne approximately 3-4 seconds, then settled back to the ground. At this point, he decided to abort the takeoff, closed the throttle, and applied full brakes. The airplane skidded for approximately 600 feet, leaving the strip. The left main gear dropped into a hole and was severed. The Beaver nosed over approximately 50°, settled back, and came to rest 45 feet beyond the end of the strip. The fact that the aircraft skidded 600 feet after the takeoff was aborted indicated that flying speed had been attained. The U-6A was trimmed nose low and it was evident the aviator had either relaxed his back pressure or pulled the airplane off in an excessive nose high attitude, causing it to stall. Damages from this accident amounted to $24,313.

the aircraft skidded for approximately 600 feet, leaving the strip . . .

accident number five came in an O-1A during an overwater flight . . .

CASE HISTORY NUMBER THREE

This aviator had his first accident while in training. He made a power off approach to a road strip, bounced, and skidded to the left. The left wing struck a tree and the O-1A plowed into the left bank of the road, causing major damage.

The very next day, he made a power approach to a field strip, bounced, and relaxed his back pressure. The tail came up, the propeller hit the ground, and the O-1A nosed over, coming to rest inverted.

This aviator's third accident came after he had finished training and built up a total of 250 flying hours. He was taxiing an O-1A on a road strip when the left wing hit a tree, causing an uncontrollable turn off the road and major damage.

His fourth accident was in an OH-13. He made a slow steep approach to a strip in a nose high pitch attitude. Instead of flying in the normal manner with his right hand on the cyclic and his left hand on the collective, he was flying with his left hand on the cyclic and his right hand on the collective pitch of the passenger's seat. The helicopter fell through from about 15 feet and landed hard, spreading the skids, and causing major damage.

Accident number 5 came in an O-1A during an over-water flight. As he approached his landfall, the oil pressure dropped to zero, the engine vibrated, and blue smoke came from both exhaust stacks and around the cowling. The aviator jettisoned the door and bailed out. Landing in the water, he was dragged under by the weight of his survival gear. He released his parachute which had his life raft attached and both sank immediately. After remaining in the water for approximately 20 minutes, he was picked up by a fishing boat. The O-1A landed in the water and was destroyed.

His last accident started out as a U-6A flight of 1600 nautical miles, with an enroute estimate of 19 hours, all to be flown in one day. The pilot was alone during this long flight. He made his takeoff in the early afternoon and reported an hour later at 11,500 feet over an enroute station. He made two fuel stops en route and continued to fly at 11,500 feet, evidently to take advantage of tail winds. Ten hours after takeoff, he approached a third en route fueling point and began his letdown. Mountainous terrain surrounded the airfield and the tops of the hills were buried in fog. Visibility was almost zero. Shortly after midnight, the Beaver crashed into the side of a fog shrouded hill. Trees

tore the wings away and the fuselage continued to the ground, slid forward, and slammed into the base of a tree. The pilot, killed at impact, was thrown from the cockpit because neither his safety belt nor shoulder harness were fastened.

This aviator's six accidents cost his life and $64,771.

CASE HISTORY NUMBER FOUR

This aviator had flown in excess of 900 hours before he had his first accident. Flying an O-1A, he was making an air search of a river in mountainous terrain. When he reached the river, he flew at an altitude of 1,000 feet at 70-75 mph, with 20° of flaps. Flying up the river, he approached a dish shaped valley with cloud covered mountains to his right. He planned to fly over a ridge to his front and thought he had enough altitude to clear the ridge by 200-300 feet. The O-1A was caught in a downdraft approximately one-half mile from the ridge and the aviator added full power, trying to climb. Realizing he would hit the ridge, he brought the nose up to a stall attitude and lowered full flaps. The O-1A hit a tree, rolled to the right, and landed upside down. The aviator and his passenger escaped injury but the aircraft was destroyed.

One year later, again flying an O-1A, the aviator selected a sandy area for landing, rolled into soft sand, and nosed over. This mishap only resulted in incident damage to the propeller.

His second accident came after he had accumulated more than 2,000 flying hours. Flying an OH-13, he was attempting to recover from a backward hover and used excessive forward cyclic, at the same time bottoming the pitch. The skid toes dug into the ground and the helicopter was pulled forward by the main rotor. It spun around and came to rest on its right side. Damages totaled $34,630.

Eighteen months later, he attempted to take off in a heavily loaded UH-1B and lost rotor rpm as he crossed over an earth bank. The helicopter landed hard, collapsing the skids, and causing $40,500 in damages.

The investigation board found that the aviator had overestimated the weight he could carry at a density altitude of 5,000 feet and had failed to monitor his instruments to detect the loss in rpm.

CASE HISTORY NUMBER FIVE

Aviator A had his first accident at the 400 hour level. Flying a CH-21C, with an IP aboard to check his autorotation proficiency, he made a practice autorotation and the helicopter landed very hard, causing major damage. The investigation board found the cause of this accident to be the aviator's failure to start a flare at the proper altitude and apply enough collective pitch to cushion the landing.

Three years later, again flying a CH-21C, the aviator was making a tactical approach when the left main gear hit a dike, severing the gear and rupturing the fuel tank. The helicopter came to rest in a ditch with major damage.

Aviator B had his first accident in an OH-23B during training. He was given a simulated forced landing at approximately 500 feet and autorotated, touching down slightly tail low. The helicopter slid forward and the front part of the main skid dug in. One main rotor blade flexed and hit the aft section of the tail boom, causing major damage.

Two years later, he was flying a UH-19D on a landing approach when the engine failed. He was not aware of engine failure and did not notice the drop in rpm until the rotor rpm dropped below the green. A witness on the ground saw the blades cone and saw the helicopter assume a flared attitude. The UH-19D hit hard, bounced, and burst into flames. One occupant was killed and the aviator and another occupant sustained burn injuries. The aircraft was destroyed. The aviator was not certain whether the collective pitch was pulled prior to ground contact. He was unable to recall his actions just prior to and following impact.

When aviator A reached the 2,000 hour level of experience and aviator B reached the 1,600 hour level, both were flying UH-1Ds in a formation of four. Aviator A was flying as IP in number 2 helicopter of the tactical formation and aviator B was flying as pilot in number 3 helicopter. The formation was flying at 750-800 feet under a 900 foot ceiling when the formation leader called to aviator A and said he was departing the formation to check the weather and find an alternate flight route. He ordered aviator A to lead the formation after he departed. As the formation leader began a climbing right turn, aviator B, who had apparently not heard the flight leader's transmission, attempted to follow and his helicopter collided with the one flown by aviator A. The two helicopters then fell and crashed, killing all aboard.

The detection and prevention of faulty habit patterns, flight techniques, and errors in judgment is possible. Repeated accidents from these factors *can* be stopped. The solution—close supervision, evaluation, and standardization lies with aviation unit commanders. Help in planning is available in the Aviation Safety Planning Guide, Appendix VI, AR 95-5, dated 30 June 1966.

Supervision and Discipline

AN AVIATOR WITH MORE than 1,800 flying hours took off for a local training flight at 0700 hours, estimating his return at 0900 hours. A witness stated the pilot had said that he planned to fly to another town for breakfast and return. At approximately 0800 hours, the airplane was seen flying north over a river at an estimated altitude of 10-15 feet.

Flight surgeon: "The aircraft was apparently flying straight and level at approximately 0819 hours (the time shown by the broken clock on the instrument panel) in a northerly direction when it struck a one inch cable spanning the river at approximately 16 feet above the water. . . . Cable markings on the aircraft indicated that the cable passed under the left wing, last touching the left wing 15 inches from the left side of the cockpit, and over the right wing, 65 inches from the right side of the cockpit. Markings inside the cockpit showed the cable passed through it on the left side 3½ inches below the top of the wing. This would have placed it at approximately 3 inches below the top of the cockpit at the mid-cockpit point. This line of position of the cable through the cockpit corresponds with the measured distance from the top of the cockpit to the head position of a 72" man sitting erect in the seat, as indicated by the cable markings found on the helmet. The position of the head in the 'ducked' position would have placed it below where the cable passed through. This suggests that the pilot did not see the cable or saw it too late to react.

"The wings were separated from the fuselage and the left and right wings from each other at the

1. Location of fuselage. 2. Location where wings were found. 3. Location of cable. 4. Railroad trestle.

. . . it can only be reiterated as it has been time and time again that alcohol and flying do not and can not mix . . .

junction of the right wing and fuselage by the cable. The wings probably fell fairly close to the cable and were taken downstream by the 9-12 knot current and were found at a position 300 feet downstream from the cable. The fuselage continued in a northerly direction and was found on its right side 120 feet upstream from the cable in 8 feet of water. The fatally injured pilot was found strapped in the seat. . . .

"Postmortum laboratory study of a specimen obtained from the right atrium revealed a blood alcohol concentration of 0.05%.

"Bjerver K, and L. Goldberg's[1] study on alcohol ingestion and driving ability found a threshold level of blood alcohol causing impairment of driving ability at about 0.035%.

"Harper and Alber's[2] study on alcohol and general aviation accidents drew a comparison of Aksnes[3] study on the adverse effects of small doses of alcohol on flying skills and Drew's[4] study on the adverse effect of small doses of alcohol on driving skills and indicated that flying skills are measurably decreased by only one-fourth the amount of alcohol necessary to produce a measurable decrease in driving skills.

"As indicated in DA Form 2397, alcohol is recorded as playing a 'suspected' causal role in the accident. Although the function of the factors of euphoria and decreased inhibitions is considered low, it may possibly have affected the level at which he was flying by a few feet. The conclusion can not be made that this factor, if eliminated, would have averted the accident, but it must be included as a suspected causal factor.

"Standard Form 88 records the pilot's distant visual acuity as 20/100, correctable to 20/20 bilaterally. Goldberg's[5] study reported in the Acta Physiol Scandinav found a detectable impairment of vision at a blood alcohol level of 0.015%.

"HUMAN CAUSE FACTORS

"1. Flying at an unsafe altitude.

"2. Failure to anticipate the hazard.

"3. Blood alcohol level of 0.05%.

"4. Personality and behavior traits associated with a higher incidence of accidents. It was felt to be necessary to include this as a factor because of two previous incidents this pilot was involved in with flying; the first while in flight training with another service when he had to parachute from a trainer he could not get out of an outside spin; and the second when he made a hard landing and bent a propeller.

"RECOMMENDATIONS

"Since a blood alcohol level was found in a specimen from this man, it can only be reiterated as it has been time and time again that alcohol and flying do not and cannot mix. . . .

". . . since an alteration from a regulation, plan or procedure is usually closely associated with lack of discipline and/or supervision and this pilot was not in compliance with the regulation covering minimum flying altitude, an improvement of discipline and supervision must be one of the recommendations."

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pearl's personal equipment and rescue/survival lowdown

Dear Army Aviation Crewmembers:

My name is Pearl and I'll be appearing on these pages regularly to talk to you and answer questions about personal equipment and rescue and survival gear. I will answer all questions sent to me. If I don't know the answers, I'll ask the experts. If *you* have a question about personal equipment or rescue and survival gear, please write to me. My address is: Pearl, U. S. Army Board for Aviation Accident Research, Fort Rucker, Alabama 36360.

PEN GUN FLARES

Have any old MK79 MOD O pen gun flares around? If so, get rid of them! Another service has reported malfunctions with these. Although there were no injuries, there were powder burns on the gloves of an instructor who was demonstrating the pen gun. The charge exploded approximately one to two feet above the flare cartridge muzzle.

The newer flares are okay. These are available through the Army Ammunition Supply and Procurement Agency, Joliet, Ill. They are only available to troops in Vietnam. However, it has been recommended that they be issued to all Army aviation crewmembers. The correct federal stock number is 1370-921-6172.

Units other than those in Vietnam can obtain these by local purchase. If your unit wants to local purchase these pen guns, write to me and I'll give you the source. The cost is $5.36 per kit (seven flares and launcher). These flares have a service life of two years. Be sure and check the date of manufacture stamped on the flares.

Remember, this device is a *gun!* Treat it with the same respect as you would your .38 or .45! Proof of the pudding is stated below. These incidents are reprinted from the November 1965 issue of APPROACH:

"Excess pencil flare gun cartridges that had not been issued to crewmembers were stored loosely in a desk drawer. It was subsequently decided to remove the cartridges and store them in a more secure place. While a squadron member was in the process of scooping up the cartridges and placing them in a nylon bag for storage in a locker, he was addressed by another individual. Looking up, he dropped a loaded, but uncocked, pencil flare gun. The gun landed cartridge-first and the charge ricocheted from the deck and struck the visitor on the bridge of the nose, producing a severe lesion. In addition, the burning charge caused burn injuries to his left eye.

"A pilot was running to man his aircraft when a cartridge in the lower leg pocket of his flight suit detonated by percussion. The cartridge and three others were inclosed with the projector in the orginal plastic bag. The projector was not loaded. The expended cartridge had a slight but definite indentation on the plastic cap."

WATER SURVIVAL

Not too long ago, an Army Aviator found himself down at sea, at night (a real *dark* night), with no signaling device (his pen gun had been left abroad ship) and a malfunctioning life vest. Whether or not the life vest was actually functional or the aviator simply did not know how to use it was never clearly established. The aviator said he thought he was pulling *up* on the CO_2 lanyards. The point is, he actually knew how to activate the CO_2 bottles, but was understandably excited and forgot!

Water survival in the Army is not as rare as some may think. Units should ensure that *all* Army crewmembers are thoroughly familiar with *all* of their equipment. This should be accomplished by repetitive refresher training and actual use of the equipment. I don't, however, advocate actual jumping from aircraft unless you are trained for this; but refresher training for OV-1 crewmembers can be given in a suspended parachute harness.

Another point about this incident — equipment left in your locker or desk drawer is no good to you when you need it. This particular flight was to be a short orientation flight, but the aircraft crashed in the water 10 seconds after takeoff! You never know when you may need your emergency equipment, so carry it at *all* times!

See you next issue,
PEARL

if you have a question about personal equipment or rescue and survival gear, ask Pearl . . .

CPT HORATIO FROZZLEFORTH "WORLD'S GREATEST AVIATOR"

THERE I WAS, DEEP IN THE JUNGLE, WITH ONLY A .45 AND A SURVIVAL KNIFE. I CREPT CLOSER AND CLOSER...
WHAT I WOULDN'T GIVE FOR A SET OF EAR PLUGS!
LATER...
CAPTAIN, DO YOU THINK WE SHOULD CHECK OUR GROSS WEIGHT? IT'S GETTING HOTTER AND THE DENSITY ALTITUDE IS GOING UP!
NO SWEAT, LIEUTENANT. THIS BEAST HAS POWER TO SPARE!
OUR RPM IS DROPPING OFF! BEEP IT UP, MAN! BEEP IT UP!
I'M TRYING BUT IT'S STILL DROPPING!
MY ANALYSIS IS A POWER LOSS CAUSED BY DECREASED ENGINE EFFICIENCY, AND POSSIBLY A COMBINATION OF DECREASED ENGINE EFFICIENCY AND FUEL CONTAMINATION. I'M SURE THE LABORATORY REPORTS WILL BEAR ME OUT!
ACDT. INVEST.
TESTS AND LABORATORY ANALYSES SHOWED BOTH ENGINES DEVELOPING FULL POWER, WITH NO FUEL CONTAMINATION PRESENT. THE CHINOOK WAS OVER MAXIMUM ALLOWABLE GROSS WEIGHT BY 1,665 POUNDS. THIS MISSION WAS AN ADMINISTRATIVE MOVE OF A UNIT'S KITCHEN EQUIPMENT, RATIONS, AND PERSONNEL. AMPLE TIME WAS AVAILABLE TO COMPUTE THE WEIGHT OF THE CARGO AND PASSENGERS...
MEN
THE WORLD'S GREATEST AVIATOR IS DOWN, BUT NOT OUT. WATCH FOR HIS NEXT ADVENTURE ON THESE PAGES.

there's no way of telling what makes an odds-on favorite lie down on the job . . .

On Your Toes Sense

Major Chester Goolrick

IT IS GENERALLY agreed in racing circles that some horses run faster than others. So okay, but what happens a lot of the time when the winner's name goes up on the board? A 50 to 1 long shot which by rights should be pulling a plough. No wonder all horseplayers die broke.

The answer to such gross injustice?

Nobody has ever talked with a horse, except on TV. There's no way of telling what makes an odds-on favorite lie down on the job. His performance — like that of human beings — probably varies from day to day according to the mood he is in, his digestion, his ambition, and the state of his love life.

One thing you can be sure of. Unless he is ridden by a top-flight jockey, a horse's chances of being first under the wire in the Derby are roughly the same as those of a snapping turtle. Those tough little men in the gaudy silk shirts aren't in the saddle simply to lend a splash of color to the scene. They are hired for one express purpose, to pilot a temperamental nag from the starting gate to the finish line by the shortest possible route in the shortest possible time.

The competition is fierce. Every owner with dreams of standing in the winner's circle holding a silver cup full of champagne spares no expense to put the best men available under contract for his stable. And, given the same general training, strength, and native intelligence, horse-pilots who wind up in the income tax bracket with the Rockefellers are the ones whose alertness is always as keen as a bat's ears.

If some horses are faster than others, some jockeys are better than others. The margin may be thin. It is there all the same. The true winner is the one who has a lightning-like ability to capitalize on opportunities as they present themselves, who never relaxes in the saddle, even when he is four lengths ahead of the field coming into the stretch, and who never finds himself faced with a situation he can't handle because he has violated one of the basic rules of the game. This is the lad who can come from behind in a driving finish, steer through holes before they have a chance to close, and wind up going away on a horse no sane bettor would risk a $2.00 Confederate bill on.

his performance varies according to his mood, digestion, ambition, lovelife...

ON YOUR TOES SENSE

horse-pilots who wind up winners are the ones whose alertness is as keen as a bat's ears

You don't have to hunt very hard to find comparisons between a horse jockey and an airplane jockey. How much you like to talk about how some aircraft can almost fly themselves, no aircraft as yet has done its own maintenance, performed a preflight on itself, left the flight line on a dangerous mission, and returned to base without the helpful services of maintenance men and a crew who were alert to what they were doing. It is still a man's world.

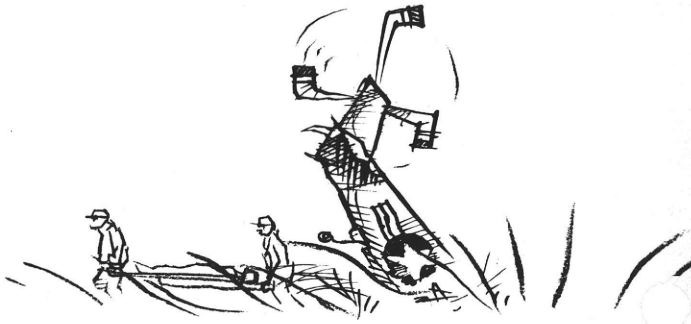
Up to a point, that is. The trouble comes when the men involved fall short of the job they are expected to perform. In Army aviation, when an aircraft rams into a hill, hits a powerline, or winds up in a groundloop at the end of the runway, the investigators usually discover human error was involved — anything from a maintenance man who torqued a bolt improperly to a pilot who bored straight ahead into a thunderhead. All right. If we have to admit that the human element is involved in nearly every accident — a lapse by mechanics, crewchiefs, pilots, or anybody else — what brings it on? Poor training? Ignorance? Hoof and mouth disease?

Perish the thought.

MOST ARMY AVIATION ACCIDENTS COME FROM LACK OF ALERTNESS THAT RESULTS IN VIOLATIONS OF TRAINING

What *causes* lack of alertness among professional aviation men trained to be on their toes and to know better is an interesting question. Sheer human cussedness is one easy answer. It is also no great medical secret that a chap worrying about a note at the bank or one who has a stomach-ache from an overdose of double chocolate malteds isn't likely to be at the top of his game.

What about the one who is as normal as blueberry pie but who lets his mind wander off into left field when it should be focused on the job at hand? The real truth is that in most cases, lack of alertness doesn't arise from any particular reason. It



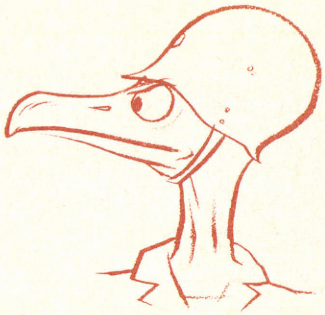
comes from a set of attitudes and conditions which have crept up on an unsuspecting airman with the guile of a party of Indians setting up an ambush.

The accident stemming from lack of alertness is only the last and explosive event in a kind of human powder chain:

- The airman falls victim to misplaced confidence.
- Which leads him into a complacent frame of mind.
- Which brings on a state of sluggishness not even a snail would boast about.

And when you're suffering from snail syndrome, it's a good bet that sooner or later, no matter what your job in aviation, you will cause an accident which could have been avoided if your wits had not been in mothballs at just the time they should have been hitting on all cylinders.

The magic formula to ward off such a deplorable state of affairs? Bad news. There isn't any. We might make a start by looking at those two Wicked Witches, misplaced confidence and complacency.



WORLD BY THE TAIL

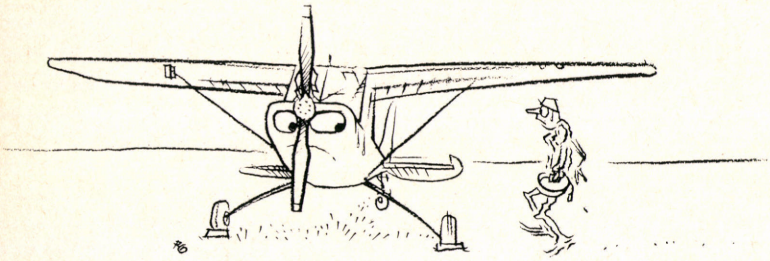
When a man steps into the cockpit of an Army aircraft for the very first time, his confidence is at absolute ground zero. After he discovers a Bird Dog or a Raven won't eat him alive and that it is actually possible to get one of the things into the air and back on the ground in one piece, his stock in himself rises gradually like a blue chip investment in a prosperity market. A little later on, when he realizes one day he no longer has an instructor aboard, he may experience a brief attack of butterflies in the stomach. As he progressively gains experience his belief in his own professional capabilities starts on an up curve.

So far so good. Healthy self-confidence is a necessary part of every professional's equipment—whether he is a grave-digger by trade or a jockey. Without confidence, a man becomes overcautious and hangs back for a split second too long, like the halfback who fails to take advantage of a hole in the line. He is thrown for a loss.

Given what we may loosely call experience — in the case of Army pilots around 500 hours or with maintenance men once they think they can do their jobs with one hand tied behind them — it is possible confidence can get out of hand. With confidence out of control, anyone is likely to

- overlook dangers in situations,
- forget fatigue factors, and
- convince himself that accidents which happen to others can't happen to *him*.

ON YOUR TOES SENSE



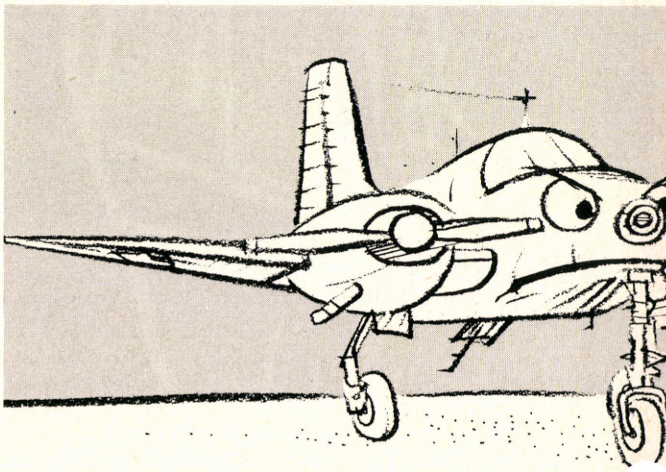
when a man steps into the cockpit for the first time, his confidence is at ground zero . . .

. . . around 500 hours, it is possible his confidence may get out of hand

He will fly in the face of direct evidence, such as an oil pressure indicator which is desperately trying to tell him that all is not well. He will sit back and relax in the cockpit or on his maintenance job when he should be giving it all the professional skill at his command. He may get away with it for a time, but he is like Humpty Dumpty in the nursery rhyme, who had no business being up on that wall in the first place. Sooner or later he comes a cropper.

Except for misplaced confidence how do you account for the instrument-rated pilot who flew into heavy weather with gusts up to hurricane force? They calculated he was doing over 200 knots when he hit the ground. Or the pilot who filed a 19-hour VFR flight plan and wound up plastered against the side of a hill? 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 this pilot's confidence had developed properly, he never would have tried, repeat tried, to take off with a doubtful engine at that altitude.

All of these poor chaps had managed to get themselves into a state of mind which prevented them from looking ahead to the possible consequences of actions no maturely confident man would have undertaken. They were in a state of complacency which had put the lid on the normal alertness which is a built-in survival factor for everybody from headhunters to little old ladies trying to cross Fifth Avenue during the rush hour.



I'M THE MOSTEST

Complacency is a state of mind brought on by misplaced confidence, easy to fall into, by which a man manages to convince himself subconsciously that he needs no further improvement. He's the last word. If he can't exactly lick his weight in wildcats barehanded there is not much else he can't handle without getting unduly winded. The world is his oyster.

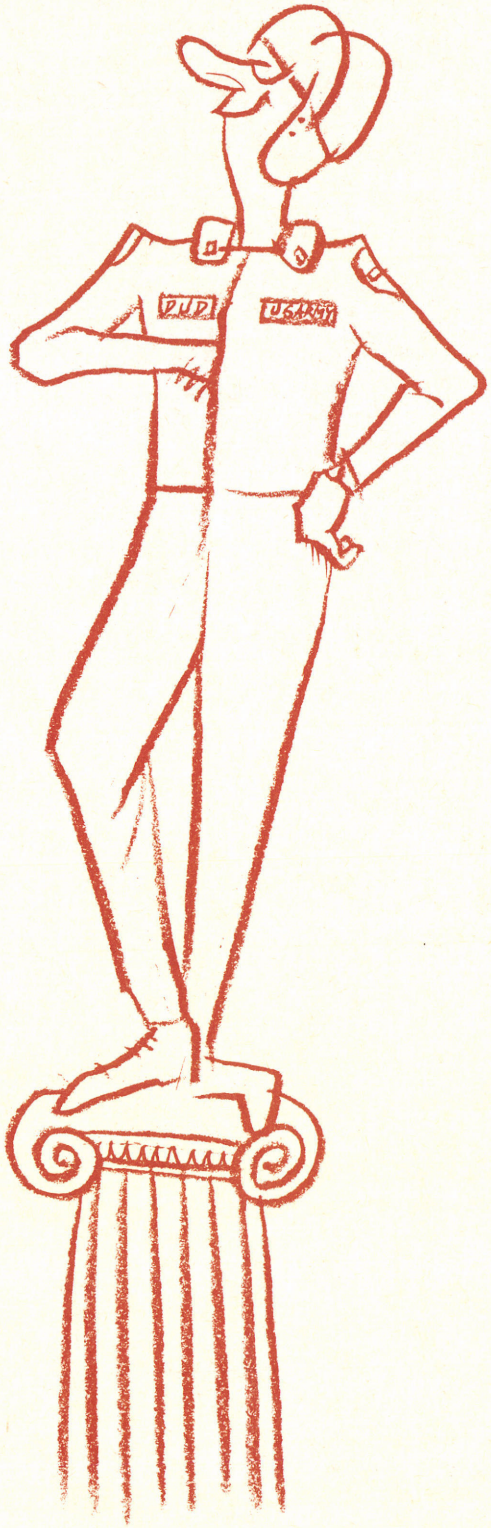
Anyone with an overload of self-satisfaction such as this is a prime candidate for a Humpty Dumpty fall which will leave him ready for a good glue job. If you happen to be an animal trainer and decide one day to take on Smoky the Bear in a no-hold-barred wrestling match, you're in for a rough afternoon. If you're a professional gambler and think you know all the tricks there are, you'll find yourself someday in a hotel room with no earthly possessions except a worn-out pack of Bicycle cards.

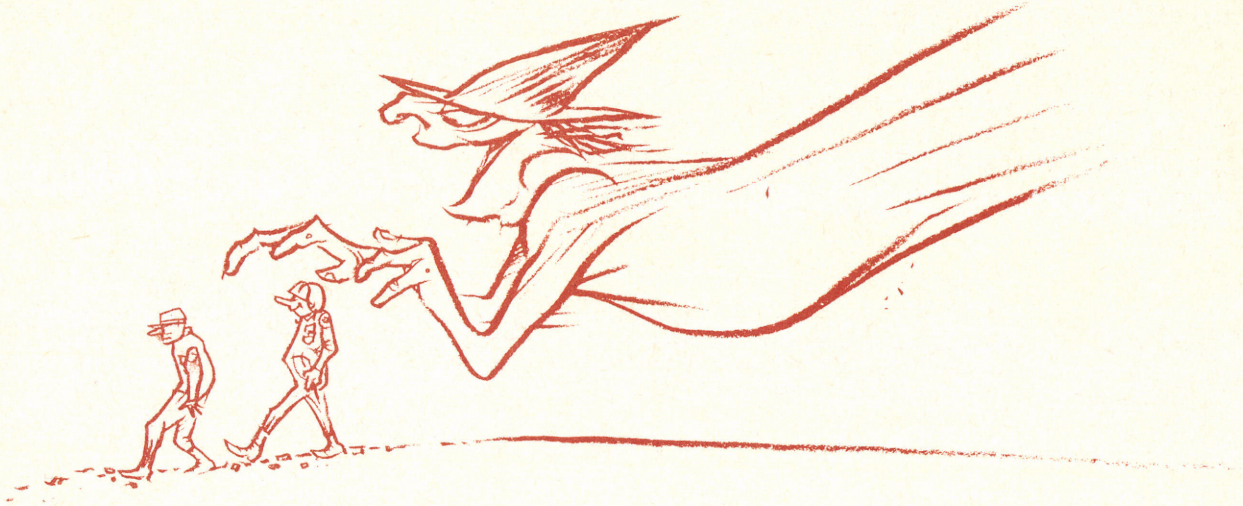
If you're in Army aviation, no matter what your job, even a moderate case of galloping complacency can and will bring on trouble for somebody — you yourself or some unfortunate soul who is the victim of your lack of alertness. You can count on it, just as sure as the rent comes due the first of each month.

How does complacency bring about this unhappy state of affairs? By numbing the built-in alertness of a trained man the way your dentist deadens your gum just before he begins hacking away with pick and shovel. Hurricane warnings go unnoticed. When the weather takes a sudden turn for the worse, an airman wrapped in a nice warm blanket of complacency has about as much margin for error as a cross-eyed tightrope walker with the hiccups.

In the grip of complacency, people overlook

. . . convinced he needs no further improvement, he's the last word . . .





even a moderate case of complacency can and will bring trouble for somebody . . .

things or fail to heed warnings they can plainly see. We've mentioned the oil pressure indicator. Now consider the fact that gear-up landings, not exactly an unknown event in aviation circles, *almost always are due to complacency*. Not long ago, for instance, a senior pilot — complacency ripens with age, like limburger cheese — set out to demonstrate the landing abilities of a Mohawk for a passenger. Before takeoff he went out of his way to inform the passenger he would leave the landing gear down. Instead, following ingrained habit, he pulled the gear up and then proceeded to land. The Mohawk came out of the affair considerably shaken up. So were the passenger's nerves.

The interesting thing about this deplorable chain of events is that not only was the red indicator lit up like a Christmas tree but that Our Hero probably would have landed gear-up even if there had been a steamboat whistle in the cockpit to set him straight. He had *told* himself and his passenger that the gear was down and, by George, no little old indicator was going to tell him different. What the indicator said was ignored. The message never reached a headquarters which had been taken over by complacency.

At this point, any red-blooded airman will be telling himself he could never be guilty of such a monumental booboo.

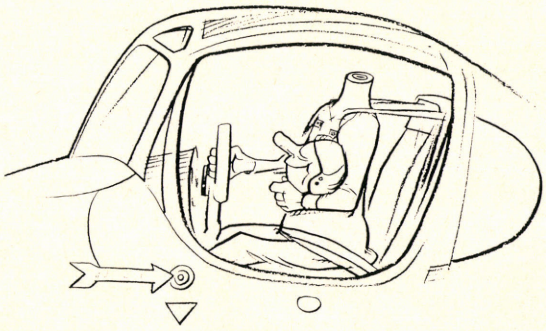
Accidents are something that happen to the other fellow, remember?

Once you convince yourself you're incapable of making an error which somebody every bit as smart as you are *did* commit, you are already a happy hunting ground for complacency. Sure, you may never land gear-up. Nearly everybody can get by for years. There are plenty of other ways you can get into water hot enough to cook a leather boot.

On desert maneuvers some time back, a unit had a variety of crashes, any of which could have been avoided if all hands had heeded words of wisdom they had heard over and over again.

They were told that extra caution is a *must* for autorotations in the rapid density altitude changes they could expect. This unit had several practice autorotation accidents because complacency with early morning performance carried over into periods when thermometers threatened to blow their tops.

gear-up landings almost always are due to complacency



You can't fly very far or very well with dirty or unsettled fuel — and deserts can dirty up fuel like nobody's business. Right? Our hapless friends had crashes caused by dirty fuel. When they got home, bruised and battered, they had at least learned one thing. It is just as easy to overlook what you *do* know as to tackle what you *don't*. The result is about the same in either case.

Misplaced confidence? Complacency? How else do you account for mid-air collisions on days so clear a mole could read the fine print on an insurance policy? Or aircraft which come down in swamps because of fuel exhaustion? You sure can't blame the aircraft, any more than a jockey who goes to sleep on the job can find fault with his horse if he finished a dead last.

OUT TO LUNCH

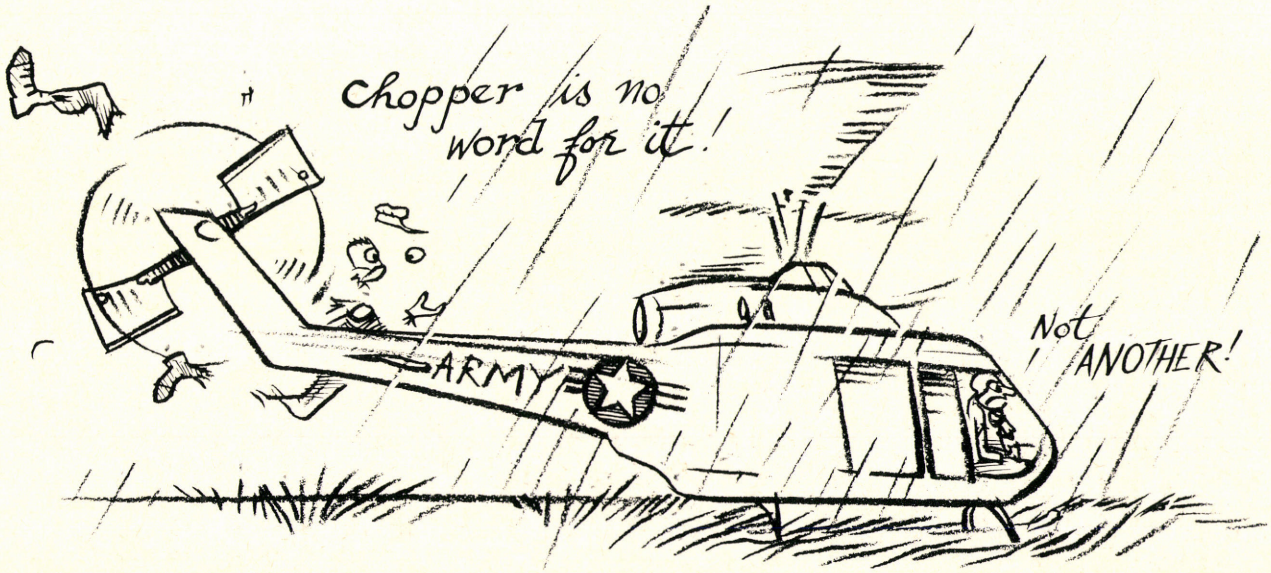
The simple — and unpleasant — truth is that the complacent man is a sluggish man. He is incapable of the kind of instant action normal alertness produces. The mental radar system he should have on duty scanning day and night has been shut down. When things get rough, he either acts too late or is forced into abrupt, hasty moves that do no more than put him deeper in the pickle barrel than he already is.

There are all kinds of built-in devices in aviation — in fact, in nearly everything — which can lull an unsuspecting soul into a complacent frame of mind and send his radar operator out to lunch. Increasing automation is one. Automobile manufacturers are beginning to realize that the easier they make it to drive a car, such as removing the stick shift and the clutch, the more the accident rate goes up. The easier flying becomes, thanks to little black boxes, the more an airman's alertness is likely to become duller than a cheap barber's razor.

Sometimes it is plain boredom. It may have taken Grandpa a couple of weeks to get from Waukegan to Winnetonka in his 1909 Maxwell, but you can bet he never got bored along the way, what with having to fix flats, crank the engine and jack the car out of mudholes. Driving was an adventure which kept the old boy on his toes. The only thing he took for granted was that any horse he came across was certain to bolt for the tall timber.

Now that things are easier, a driver is more apt to relax behind the wheel to the point of stupefaction. To be honest, how many times in your recent wanderings have you heeded warnings of a sign at a railway crossing? True, you haven't been hit by a train, but could it be you read only last week about somebody who *was?*

Mechanics walk into tail rotors because sluggishness has fogged them in to the point where they no longer heed the warning ordinary common sense would be happy to give them. Pilots prepare faulty flight plans because they have reached the point where they can't see much difference between right



and wrong. Or they pass up the thorough preflight as a waste of time.

In the end they are presented with a bill to be paid in full. Let us spare ourselves all but one example. An Iroquois crash recently was caused by fuel starvation because of an improperly installed quick disconnect fuel coupling. The coupling is easily accessible, easily spotted. The pilot passed it up on his preflight because if he gave it any thought at all, he made the mistake of assuming everything was fine and dandy. Nowadays he's so cautious he won't dive into the club pool without checking it over for sharks.

DOUBTING THOMAS

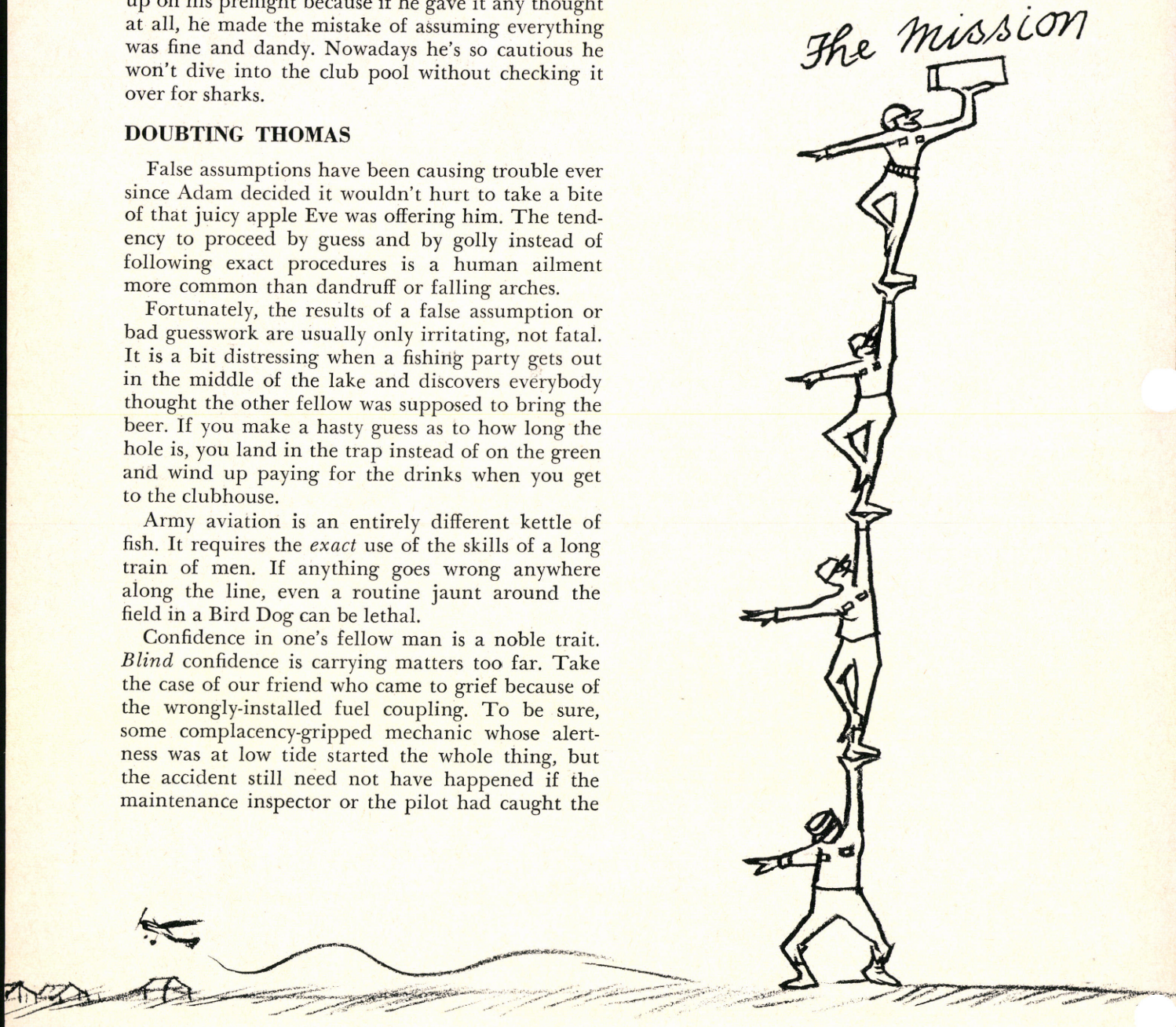
False assumptions have been causing trouble ever since Adam decided it wouldn't hurt to take a bite of that juicy apple Eve was offering him. The tendency to proceed by guess and by golly instead of following exact procedures is a human ailment more common than dandruff or falling arches.

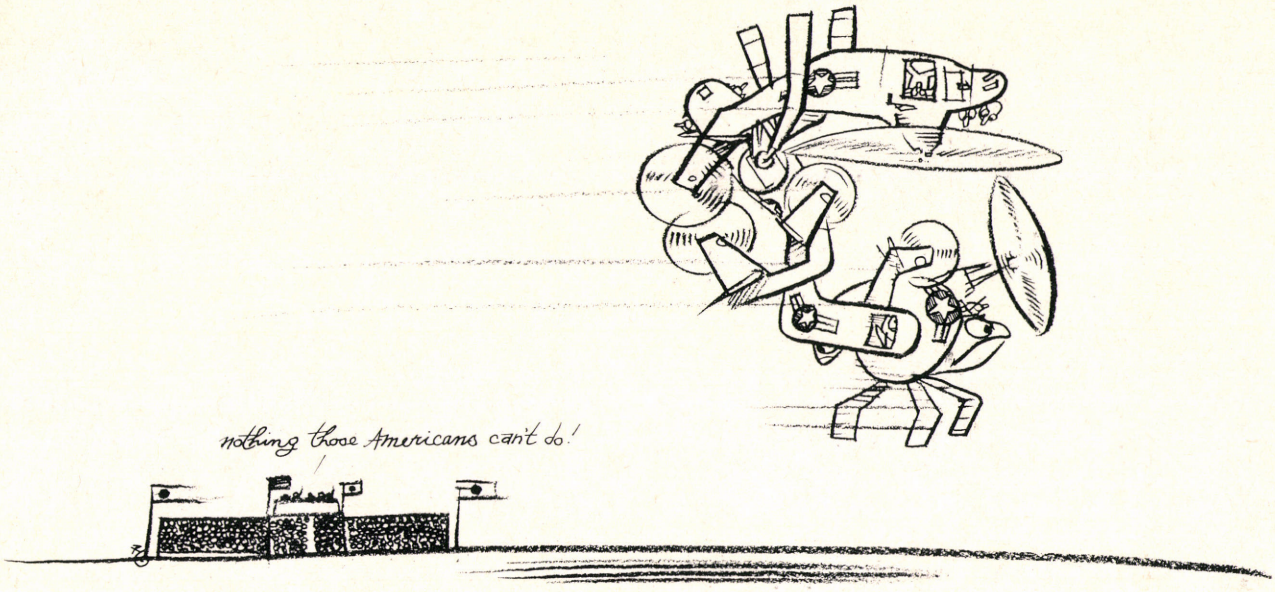
Fortunately, the results of a false assumption or bad guesswork are usually only irritating, not fatal. It is a bit distressing when a fishing party gets out in the middle of the lake and discovers everybody thought the other fellow was supposed to bring the beer. If you make a hasty guess as to how long the hole is, you land in the trap instead of on the green and wind up paying for the drinks when you get to the clubhouse.

Army aviation is an entirely different kettle of fish. It requires the *exact* use of the skills of a long train of men. If anything goes wrong anywhere along the line, even a routine jaunt around the field in a Bird Dog can be lethal.

Confidence in one's fellow man is a noble trait. *Blind* confidence is carrying matters too far. Take the case of our friend who came to grief because of the wrongly-installed fuel coupling. To be sure, some complacency-gripped mechanic whose alertness was at low tide started the whole thing, but the accident still need not have happened if the maintenance inspector or the pilot had caught the

Army aviation requires the exact use of the skills of a long train of men . . .





mistake. Here is a first-rate instance of what we might call the deadly chain, brought on almost entirely by everybody concerned making the assumption that the man just down the line had acted the way the book calls for.

The alert man never guesses. He never assumes that everything is going to be as right as rain with the other fellow he is working with. About a year ago, the program for a ceremony called for a mass flyby of helicopters. The schedule was for them to lift off together and come by the stands at a low altitude. That is what they were *supposed* to do and that is what one unfortunate pilot assumed was what *would* happen. When the chopper just ahead of him had a power failure just at takeoff, he crashed into it head-on from the rear and the resultant mess is something nobody involved likes to think about to this day.

It was a classic instance of the way a lack of alertness, misplaced confidence, complacency — three words covering a state of mind in which guesswork comes easy and action comes hard — had ganged up to exact a payment higher than a first mortgage on the White House.

EXTRA DIVIDEND

But cheer up, men!

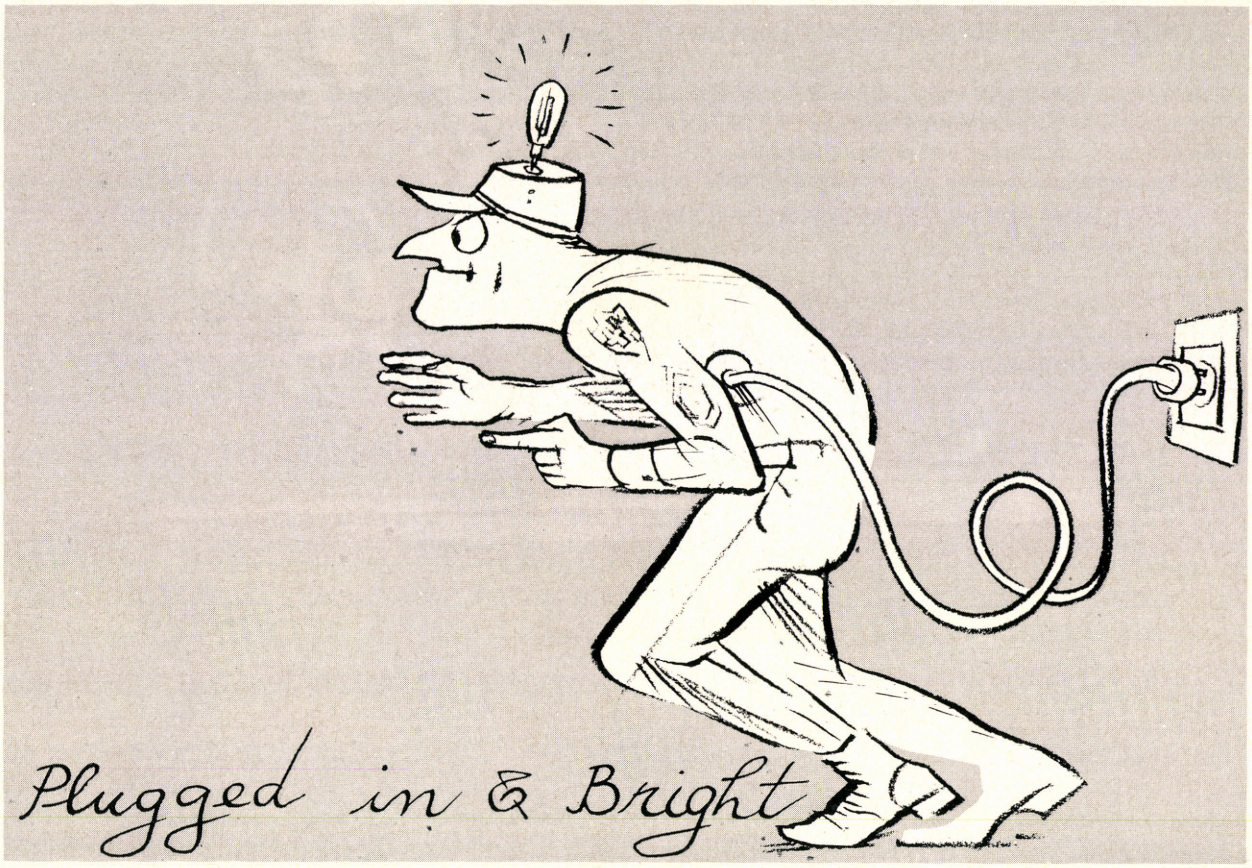
All is not dark.

As they say, every cloud has a solid-silver, handcrafted lining. True, lack of alertness can penalize a man more than half the distance to the goal. It is also true that a full measure of alertness gives airmen the booster thrust which enables them to take extra, authoritative action when emergencies arise. The result is a dividend in accidents avoided and lives saved.

It is easy to point to mishaps brought on by pilots or maintenance men whose alertness has been turned off to save current. It is harder to spot accidents which did not take place because some bright lad was on his toes, prepared for immediate moves the unexpected usually calls for.

They happen. Captain William H. Read, for example, was flying a service mission in the mountains of southern Iran when a bird hit the tail rotor of his OH-23F, snapping one blade off at the yoke. The chopper developed severe vibrations and he lost tail rotor control. Read autorotated to the only available area, the bottom of a narrow gorge between two steep mountains. A running landing was out of the question on the sloped and rock covered terrain, so he made a partial power recovery. As the helicopter started turning, he completed a hovering autorotation in an almost impossible area, with the main rotor blades tipping the leaves of a tree and the tail rotor less than 6 feet from a large boulder.

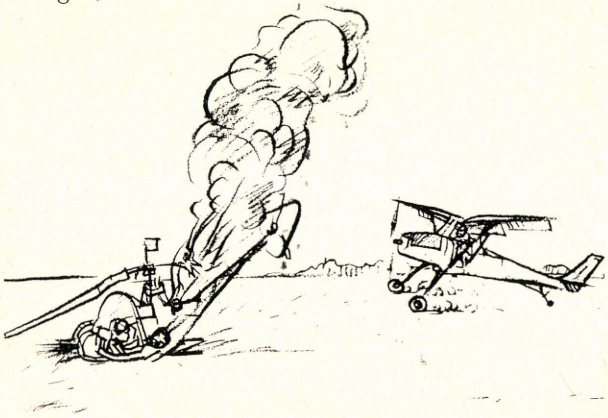
Anyone on the scene in Vietnam could tell you a dozen or so examples of how alertness has rescued a situation which looked hopeless. The veteran in the jungles regards alertness with the same respect misers look on uncut diamonds. They could run down a list of men who lacked all the alertness they needed and who aren't with us any more, and another list of chaps who stayed on their toes and are still hale and hearty.



Alertness pays off like the daily double in almost any type of incident in Army flying you could think of. Consider a few:

Quick action by a flight instructor who landed nearby and pulled a student from a flaming helicopter wreck saved one life. A few seconds' delay in thinking and in taking correct action would have made the difference.

When the fuel control of a UH-1B pooped out in flight, the IP took over the controls from his student and landed on the only available space, a boys' club baseball field.



Forced to enter autorotation over a wooded area, a CWO chose the clearest spot available and cushioned his landing by riding a sapling to the ground. A flat-footed thinker would have ignored the sapling and landed in several pieces instead of one.

When the pilot of a UH-1 in a night scramble over Vietnam was forced by an emergency into autorotation, the complete overcast above him made the terrain about as visible as the lowest level of a West Virginia coal mine. Things looked black indeed. In short seconds the pilot in the lead Huey swung back and lit the area with the powerful searchlight he had. Result: everybody slept in his own bed that night.

By this time, even Rip Van Winkle Dimbulb, the human sloth, should begin to grasp the moral. In or out of combat, no matter what the task, no one engaged in Army aviation can afford to let up on his alertness for so much as a split second. A split second is all an emergency needs to get the jump on the man who has let misplaced confidence take over his mental controls.

MENTAL CALISTHENICS

Well and good. Rip may be a little slow on the uptake. The rest of us got the point a good way back down the road. But once we face the fact that lack of alertness is a continuing cause of Army aviation accidents, what do we do to keep the statistics from growing?

We've already realized there is no easy, handy-dandy formula, no three-times-daily magic pill guaranteed to ward off fallen arches, do away with warts, and put you up on your mental toes for the rest of your life. Here is a case in which the usual ounce of prevention must be followed by constant application of good old-fashioned common sense.

The common sense aviation man

Knows himself
Knows his aircraft
Knows his job

AND TRANSLATES THAT KNOWLEDGE INTO SOUND PERFORMANCE

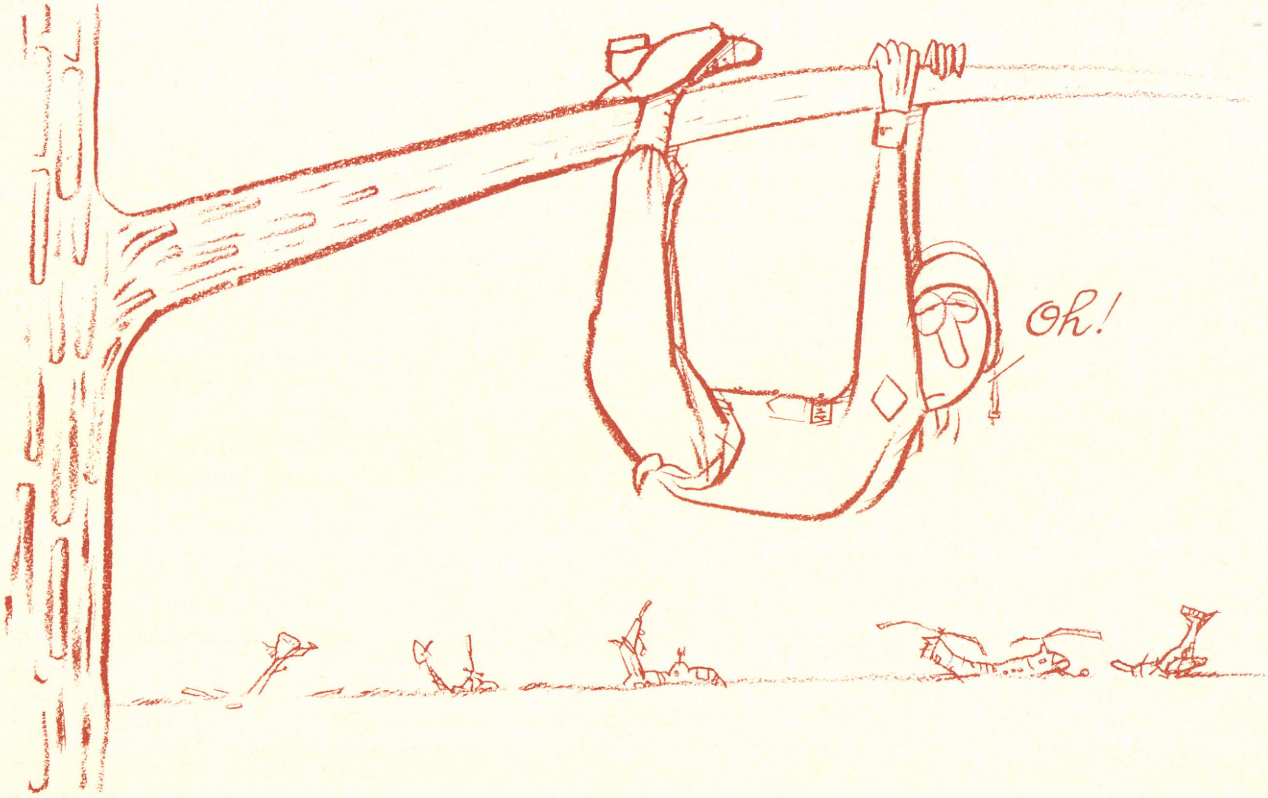
It sounds simple.

It is, as long as it is followed to the letter *all the time*.

The nonalert aviation expert saddled with misplaced confidence and complacency gets into trouble by kidding himself into thinking he can get away indefinitely with even the slightest deviation.

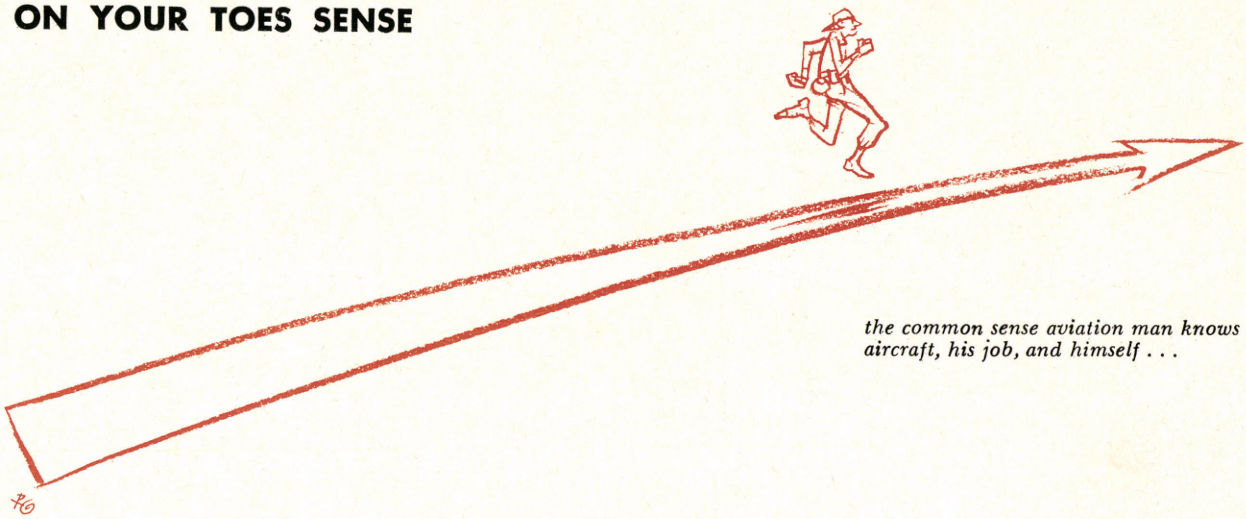
the flat-footed thinker

Suppose, for instance, a pilot is not yet instrument rated. He still has limitations in this particular field of flying skills. This won't hurt him as long as he remains keenly aware of the gap and stays out of situations beyond his control. A noninstrument rated pilot is naturally not likely to head full bore into something which looks like a Kansas twister, and neither will anybody else — no matter how ex-

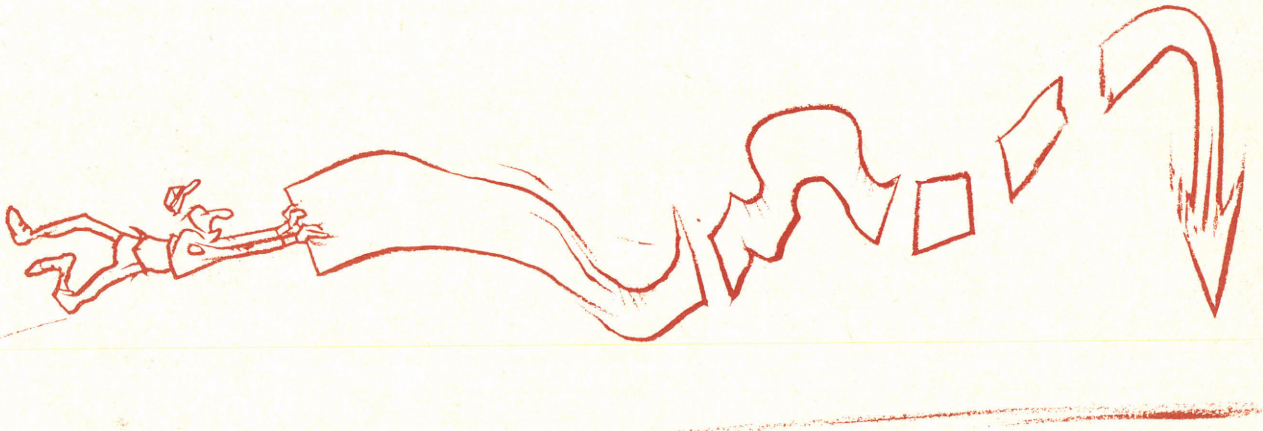


even Rip Van Winkle Dimbulb, the human sloth, should begin to grasp the moral . . .

ON YOUR TOES SENSE



the common sense aviation man knows his aircraft, his job, and himself . . .



misplaced confidence and complacency bring trouble . . .

perienced. The noninstrument rated man, unless he is fully on his toes, *might* fly into marginal weather which can put him beyond his depth before he has a chance to turn back. By lowering his alertness for just that split second he puts himself squarely in the pickle barrel.

When you are alert, you are maturely conscious of your own abilities and your own limitations, something nobody else on earth can do as well as you yourself, not even your wife. You are as likely to relax on the job as the night watchman at Tiffany's jewelry store. The job you have to perform might be pumping JP-4 into a Huey or flying that Huey to pick up a downed pilot in a rice paddy. Whatever it is, you convert the sound training you have been given, your native skill, and your alertness into expert accomplishment. You never go over the limit. You don't go into anything *tricky* without assessing the demands of the task against a sound appraisal of your own abilities. You are never guilty of a rash or unnecessary action.

If you can honestly say you fill the bill, your alertness center is in good working order. If you can't, you had better haul out your pocket dictionary and look up the word complacency again.

All this, of course, supposes your mental and physical plants are operating the way they should be. Ideally, an Army Aviator should be always in shape to go 15 rounds with the champ and should have no more emotional woes than a happily married billionaire. Unhappily, very few people have fairy godmothers handy to make every wish come true. The Army hasn't been able to sign one up either. Aviation crewmembers can come down with as-

sorted aches and pains and worry about meeting the loan at the bank, just like butchers and bakers. In combat and on maneuvers, everybody in the unit including the mascot is likely to be so bone-tired he could sack out on a mattress filled with broken beer bottles.

The *alert* man knows this and redoubles his guard. If he's fatigued, he leaves an extra margin to compensate for the slowdown in his physical and mental reactions. He never attempts to conceal anything which is gnawing on him. A man in the cockpit or repairing an engine can't be fully alert to the task at hand if he is also worrying about a sick child or nursing a wisdom tooth which feels as if it were constructed of red hot plutonium. In fact, he is a positive hazard — to himself and to anybody else in aviation he comes across during the course of a long, hard day.

Alertness?

Who's in charge?

You or complacency?

TAKE IT FROM HERE

Write it down somewhere or have it tattoed on your chest. *People* have accidents and when they do, you can chalk it up to lack of alertness.

This makes alertness something an aviation crewmember needs the way a bullfighter needs a cape. There's no more important trait in the book.

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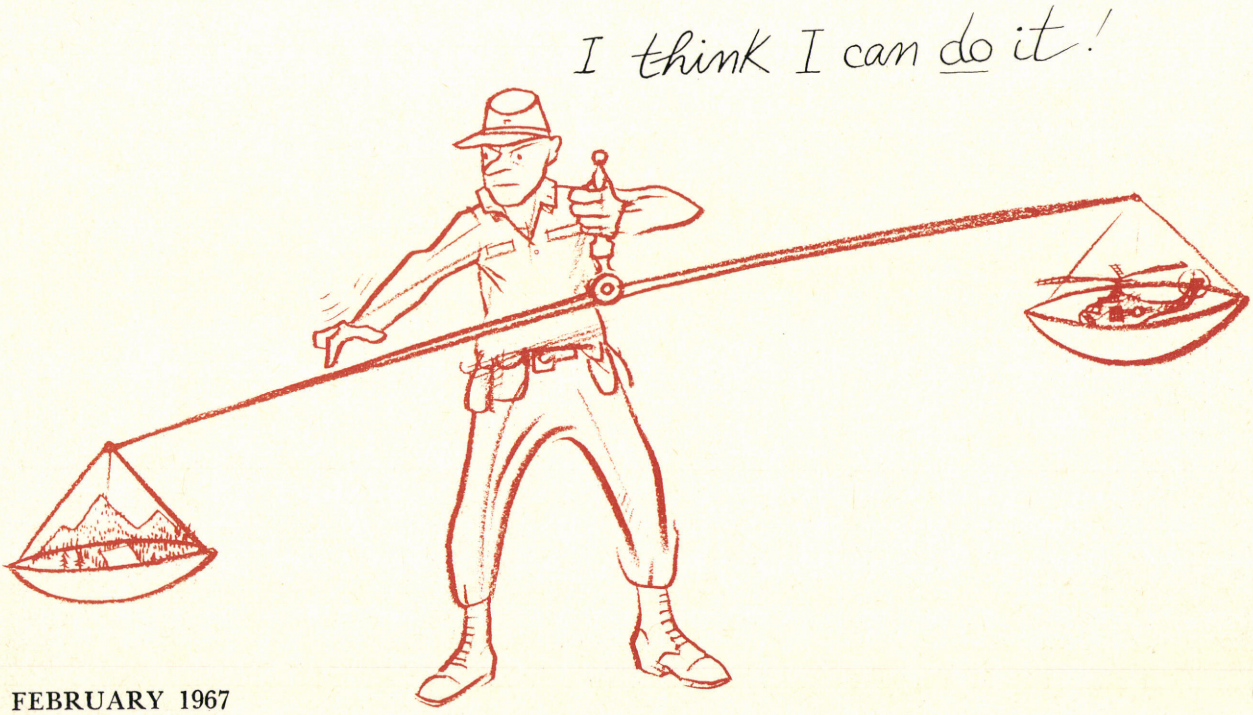
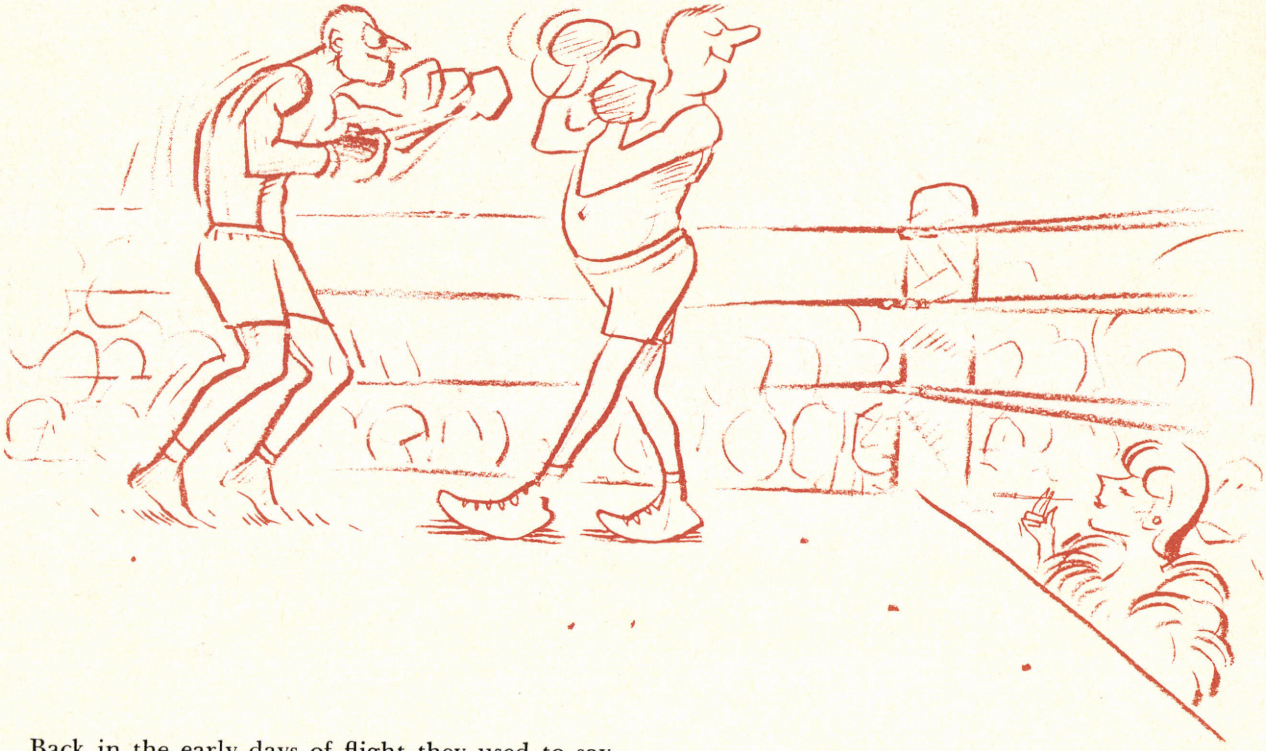


ON YOUR TOES SENSE



Back in the early days of flight they used to say you needed luck more than anything else. The surviving old-timers will *tell* you they used up all the available supply. They got through the era of the Spad and the Jenny because super-keen alertness was about all they had to go on. The ones who relied on luck never got back from Over There.

It is a fact that the *system* works because it is a system which has been carefully designed and thoroughly tested. A part of the system is the alert man performing his job the way he has been trained. Put in a man who is *not* alert? The system develops pings. Red indicators come on. Eventually something breaks down because where the system calls for fast and accurate action, somebody who is not alert makes an *ill-considered* move in a vain attempt to catch up. And once nonalertness clogs the works, another needless accident is about to be written down in the books. All too often, another crewmember is written *off*. Sometimes it isn't even *his* fault.

Alert Army aviation men in every category know, like prize fighters, that they can never come down off their toes and relax. Start shuffling flatfooted around the ring and start admiring the blonde babe in the front row and it is only a matter of time before you find yourself flat on your back in the ring while the ref winds up the count.

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AN APPEAL TO THE LADIES

SOCIOLOGISTS CURRENTLY maintain that the average American woman's burden is becoming easier, whereas that of her spouse follows an opposite trend. In this age of precooked foods, supermarkets, superkitchens, and maximum outside services, the All-American Girl is unique among the world's housewives. Although there still exist some backbreaking tasks that confronted her mother and grandmother, automation and time saving innovations have erased much of the drudgery from her domestic role. She tackles her work with comparative ease and, for a minimum effort, is rewarded maximum leisure time.

Providing the wherewithal for the domestic utopia with which he has surrounded his bride is the American male. However, to supply the needs of his modern family, he has to sacrifice some peace of mind. In an aurora of growing job specialization and career competition his burden increases. The ulcers, nervous disorders, coronary attacks, and strokes common today are testimony to the pressures and excessive pace confronting the male breadwinner.

Medical authorities cite excessive worry, frustrations, anxiety, and fatigue as direct factors in many cases of ill health. The problem is now so acute that some sociologists are concerned lest we eventually face an overpopulation of women as vast numbers of the "stronger sex" succumb to their personal anxieties.

DOES HE WORRY ABOUT END-OF-THE-MONTH BILLS???

The situation is not limited to the industrial scene. Our aviators also strive to achieve in an extremely competitive career field. They work with equipment that demands a high level of technological "know-how," specialization, and physical fitness. Available statistics indicate that most aviators are married. This then is an appeal to the ladies, specifically, to the wives of our aviators.

Your husband has proved through competitive training and examination that he is capable of flying. He has demonstrated that the care and manipulation of certain flying equipment may be entrusted to his care. This equipment is some of the best, so sensitive and complex that intense concentration, skill, and common sense must be used in its operation.

However efficient the flying machinery may be, it has an Achilles Heel. Its weakness lies in a human factor: the pilot at the controls. As an aviator's wife you may, or may not, be included in this human factor.

Does your husband-pilot often complain of exhaustion? Some of our pilots arrive at the flight line thoroughly tired from late hours the night before. There are many others who leave their castles without adequate breakfasts, only to "peter-out" during midmorning. How many times a week do YOU make breakfast for your spouse? Do you feed him properly balanced meals? Enough salads? Enough proteins? Do you let him get overweight?

Does he worry and complain about end-of-the-month bills? If so, do you economize the following month? Perhaps he calculates how they will be paid when he should concentrate on his flight. Do you attempt a peaceful and happy atmosphere in the home when he returns at the day's end? Do you allow the children to be noisy when he is tired? Do you insist upon entertaining or accepting invitations from persons he dislikes? Although his duty may absent him from the house most of the day, is he actually the HEAD OF THE HOUSE?

You may be responsible for an aviator-type who is both unfortunate and relatively common in aviation. The flier who worries about money, the much-married fellow who is browbeaten by a domineering wife, the constantly tired pilot, or the old timer who goes up each day in unfit physical condition — all are prime examples of accidents waiting to happen. Give them an airplane and the odds are that, sooner or later, they will be exhibit number one in an accident investigation!

Your husband may be the outstanding "watchdog" on his post, but under those wings or rotors he is a simple creature. Give him a feeling of security and importance. Make him think he is eating better and receiving more care than ever in his life. Don't let him do all the worrying; after all, two heads are better than one. When he is at home, see to it that there is peace and quiet around the hearth.

With a little effort you'll succeed in your obligation to make him happy, adjusted, and a safe aviator. Don't try to remake him. Just try to preserve him. REMEMBER — TWO HEADS ARE BETTER THAN ONE ON THIS PLANET!!

DOWNING ARMY HELIPORT

Major W. F. Gabella

THE U. S. ARMY Primary Helicopter Center, Fort Wolters, Texas, formally dedicated its new $1.9 million, 96-acre heliport to the memory of COL Wayne E. Downing on the tenth anniversary of the establishment of the U. S. Army Primary Helicopter School, September 30, 1966.

COL Downing, a pioneer Army Aviator, served as the first assistant commandant of the USAPHS from 1956 to 1958. He was killed in a USAF freak helicopter crash in 1961.

One of the largest exclusively designed heliports in the world, Downing Army Heliport will serve as the maintenance and operational base for the entire fleet of 350 TH-55A trainers used in the USAPHS helicopter pilot training programs.

The balance of the aircraft training fleet consists of 412 OH-23Ds based at the Fort Wolters main heliport.

Downing Army Heliport is located approximately 1 mile south of Fort Wolters, adjacent to Mineral Wells municipal airport. Its asphalt parking apron is 46 acres in size and can accommodate 300 aircraft.

The operational nerve center of the heliport complex is an 80′ x 750′ permanent hangar.

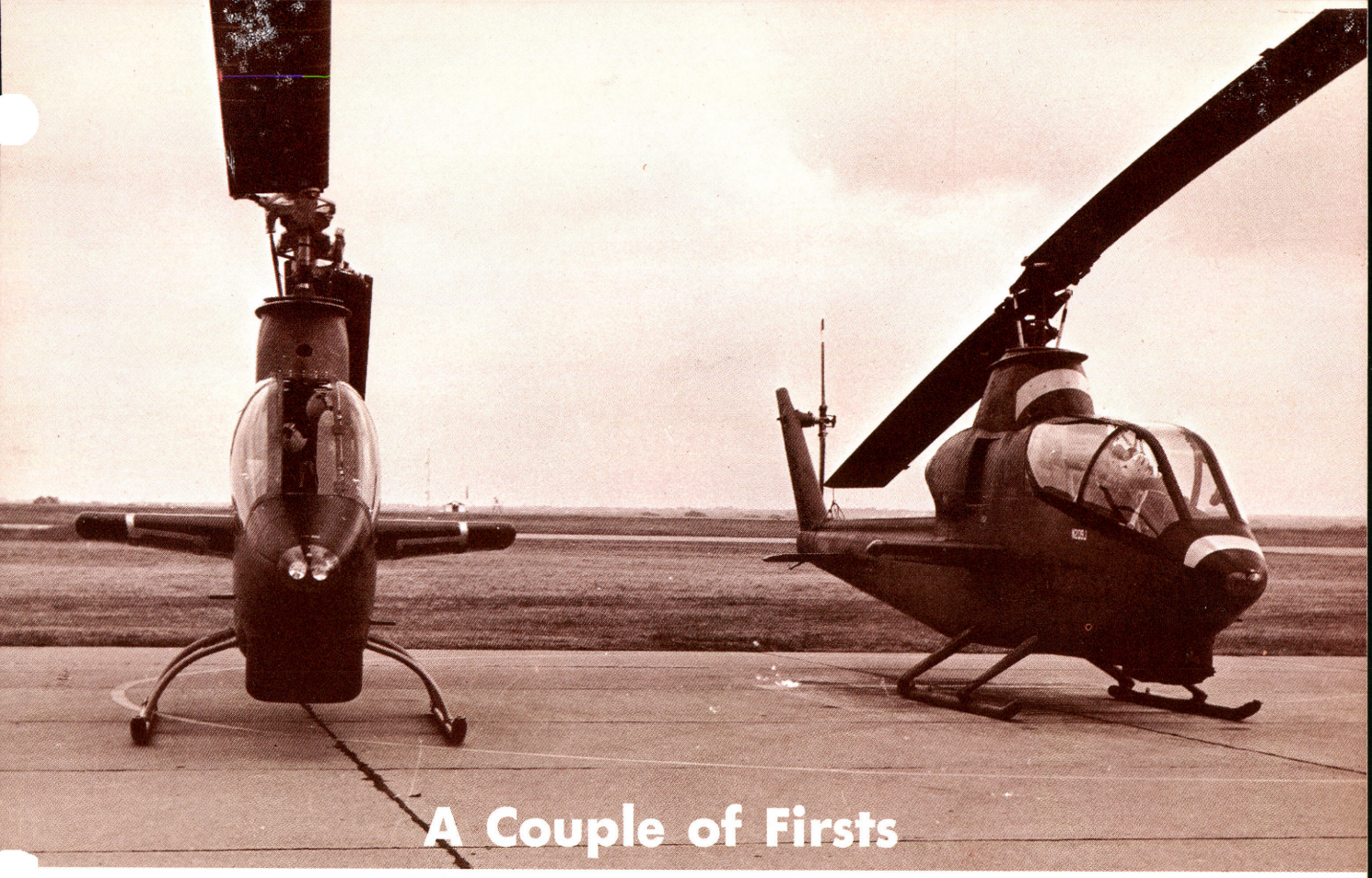
MAJ Gabella is Information Officer, Ft Wolters, Texas.

Fort Wolters' new heliport is named for COL Wayne E. Downing (above)

Along with a four-story control tower, the main hangar houses classrooms, administrative offices, maintenance shops, briefing rooms, and two huge wings which can house 48 aircraft undergoing maintenance. Surrounding the hangar complex is an additional asphalt apron, 320′ x 896′, which includes aircraft washing facilities.

Other facilities include an underground fuel storage complex capable of storing 60,000 gallons of aviation fuel plus an additional 20,000 gallons of mogas. Dominating the heliport is a half-million gallon water storage tower. Housed separately from the hangar complex is a modern aviation fire and crash rescue station.

On hand for the dedication ceremony, which was witnessed by more than 1,400 people, were: Major General John J. Tolson III, Commanding General, U. S. Army Aviation Center at Fort Rucker, and Mrs. Esta Mae Downing, widow of the late COL Downing, and her son and daughter-in-law, Mr. and Mrs. C. Glenn Downing.



A Couple of Firsts

Textron's Bell Helicopter Company displays the first of two production models of the HueyCobra (upper left) alongside the company's prototype. The Army has ordered 110 HueyCobras with first deliveries slated for next spring.

Below, the first T-41Bs to arrive at Ft Stewart, Ga., are parked at Liberty Army Airfield. The Army recently moved a part of its primary fixed wing training program from Ft Rucker, Ala., to Ft Stewart (see "A Nest of Rebels," page 32).

'AMOR SEAT'

RESPONDING TO a U. S. Army need for ballistic protection for UH-1 aircraft assigned to the Vietnam mission, Aerojet-General Corporation's Von Karman Center produced a special lightweight armor to protect the pilot and copilot while flying the versatile helicopters.

The first armor was designed, produced, accepted and delivered in a record five weeks time in April of 1965. Made from Aerojet developed armor materials, the unit came into being through the combined efforts of the U. S. Army Aviation Materiel Command, the UH-1 Project Manager Office, and Aerojet.

The UH-1 seat equipped with the armor shell offered:

— The first armored helicopter seat specifically designed for the purpose. It replaced kits which were previously added to unarmored seats.

— Greater ballistic protection with less weight than anything available as well as improved crash safety.

— The armor was designed in such a way as not to interfere with the operation of the aircraft controls.

— A sliding shoulder panel to permit ready ingress and egress of pilot or copilot.

— Flexibility of installation in the field on either UH-1B or D model helicopters.

Since the initial acceptance of the units, the design has been improved further and deliveries of the improved armor shells have commenced this year. The new design, result of a special development contract directed by the UH-1 Project Manager's Office, brought about a 15 percent reduction in weight. The total seat weight now is 140 pounds with the same level of torso protection afforded by the earlier design.

The new seat is also stronger. It is capable of withstanding a 15 g crash load. A tilt-back feature permits ready application of first aid to an injured pilot or copilot as well as expediting the removal of either from the control area. The newly optimized design is now being factory installed on all UH-1B gunships, as well as UH-1D troopships.

In recent months, a number of reports have been received that indicate that the armored seats are being well accepted by the troops and have resulted in saving a large number of lives.