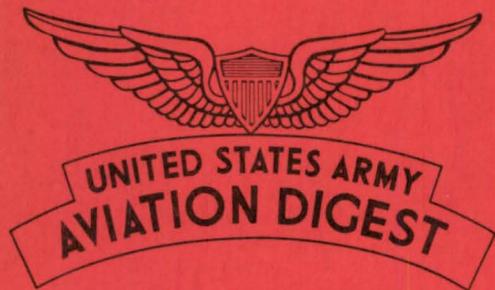
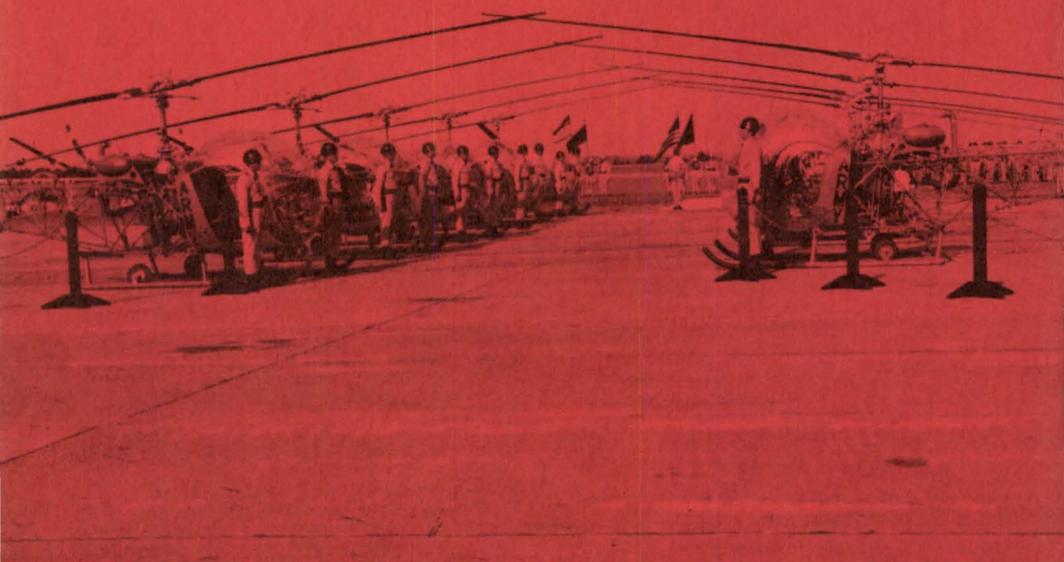


FEBRUARY 1959



LIBRARY, USAARU  
FT RUCKER, ALA



THE UNITED STATES  
ARMY AVIATION SCHOOL  
FORT RUCKER, ALABAMA



#### EDITORIAL STAFF

Capt Theodore E. Wasko  
William E. Vance  
Fred M. Montgomery

The U. S. ARMY AVIATION DIGEST is an official publication of the Department of the Army published monthly under the supervision of the Commandant, U. S. Army Aviation School.

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.

Manuscripts, photographs, and other illustrations pertaining to the above subjects of interest to personnel concerned with Army Aviation are invited. Direct communication is authorized to: Editor-in-Chief, U. S. ARMY AVIATION DIGEST, U. S. Army Aviation

#### U. S. ARMY AVIATION SCHOOL

Brig Gen Ernest F. Easterbrook  
*Commandant*

Col John J. Tolson  
*Assistant Commandant*

#### SCHOOL STAFF

Col William R. Tuck  
*Director of Instruction*

Col Jay D. Vanderpool  
*Combat Development Office*

Col Edward N. Dahlstrom  
*Secretary*

Lt Col Rollie M. Harrison  
*Aviation Medical Advisor*

Lt Col James L. Townsend  
*CO, USAAVNS Regiment*

#### DEPARTMENTS

Col Robert H. Schulz  
*Maintenance*

Col Russell E. Whetstone  
*Tactics*

Lt Col Raymond E. Johnson  
*Rotary Wing*

Lt Col Howard I. Lukens  
*Fixed Wing*

Lt Col Thomas J. Sabiston  
*Publications and  
Non-Resident Instruction*

---

School, Fort Rucker, Alabama.

Unless otherwise indicated, material in the U. S. ARMY AVIATION DIGEST may be reprinted provided credit is given to the U. S. ARMY AVIATION DIGEST and to the author.

The printing of this publication has been approved by the Director of the Bureau of the Budget, 22 December 1958.

Views expressed in this magazine are not necessarily those of the Department of the Army or of the U. S. Army Aviation School. Unless specified otherwise, all photographs are U. S. Army.

#### Distribution:

To be distributed in accordance with requirements stated in DA Form 12.

# UNITED STATES ARMY AVIATION DIGEST

---

---

Volume 5

February, 1959

Number 2

---

---

## ARTICLES

Kick the Tire and Light the Fire! . . . . .	2
Grow Old Along With Me . . . . .	6
Invisible Wings . . . . . <i>Dorothy Johnson</i>	12
Schools Can't Do It All . . . . .	14
Fly Better Through Discipline . . . . . <i>William E. Vance</i>	19
Prone To Err? . . . . . <i>Pierce L. Wiggin</i>	22

## DEPARTMENTS

Memo from Flight Surgeon . . . . .	16
Puzzler . . . . .	18
Gray Hair Department . . . . .	26

---

Discipline has many faces, an example of which is the "spit and polish" personified by the Helicopter Honor Guard at the U. S. Army Aviation Center. In addition to "spit and polish," these flying officers on our cover have what it takes in the way of flying discipline. For the whys and wherefores of flying discipline turn to page 19.

---



**Oil filler cap left off**

## **KICK THE TIRE**

*and*

## **LIGHT THE FIRE!**

**N**OTHING GETS your dandruff up more than being put on the spot by someone's carelessness. As a matter of fact, it is enough to make you downright indignant. But what about the guy who finds himself out on a limb because he neglects to observe the simplest rules of common sense and self-preservation? This is what happens to the Army Aviator who fails to perform a thorough and proper preflight, thereby placing himself in a hazardous situation.

One aviator took on a passenger and his gear and began a takeoff only to find his Bird Dog veering to the left toward a ditch alongside the runway. Despite desperate efforts by the pilot to regain directional con-

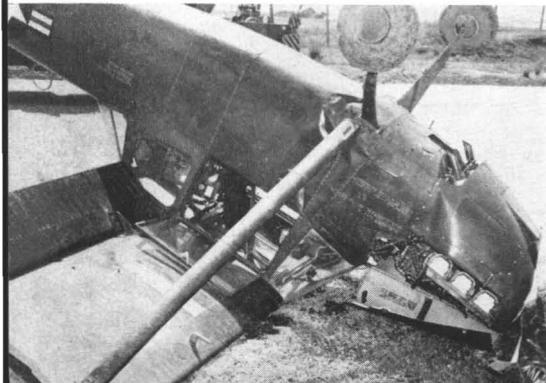
trol with the right rudder, the aircraft hit the ditch and ground-looped. Rescuers discovered that the rear controls had been locked by the inexperienced passenger who, not having been briefed to stay clear of the controls, had inadvertently placed his foot on the left rudder pedal.

Another aviator touched down at a civilian installation for refueling, then continued on his way. After 50 minutes in the air, he noticed that the oil pressure gauge indicated a loss of pressure, followed a short time later by a rapid loss of engine power. Selecting a field for the moonlight forced landing, he took the Bird Dog in. The aircraft ended up on its back with the underside covered with oil; the oil filler cap was off.

A simple mistake that could happen to anyone, you say. Simple, yes. Expensive, too!

Then there was the aviator and his passenger who carefully untied both the Sioux' tie-downs on the right skid and the rear tie-down on the left skid, each assuming that the other had untied the front tie-down on

**Passenger's left foot on rudder pedal**



the left skid. Attempting to take off, the aircraft tilted to the left, the blades struck the ground and the aircraft rolled onto its side.

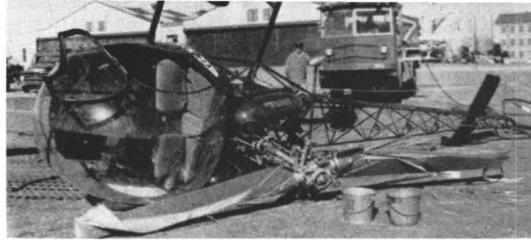
These examples are cases in which the pilots escaped with only scratches and minor injuries. All, however, are not so lucky when they "kick the tire and light the fire." It is the fortunate aviator who destroys only his aircraft. Some suffer painful, permanent injuries; some pay the supreme price.

Proceeding down the runway on a routine flight mission, the Seminole ran over the end of the runway and crashed, demolishing the aircraft and fatally injuring the pilot. During preflight, the victim had overlooked a missing aluminum rivet that secures the control column locking pin to the control column locking plate. The control column locking pin was partially inserted in the control column, locking the ailerons and elevators.

A growing stockpile of accident files provides mounting evidence of inadequate preflight as a major cause factor.

Mishaps caused by incomplete preflights are not confined to the novice or inexperienced pilot. Records show that the old pros of the air are also susceptible to preflight error. One such aviator was a test pilot with nearly 10,000 hours logged. Another, barring his accident, would have soon attained the coveted distinction of Master Army Aviator.

Kick that tire, but before starting the fire, remember, there are other steps. It is the responsibility of every aviator



### Tie-downs not untied

to determine that his aircraft is ready for flight prior to takeoff. The schools can teach you how to perform a preflight inspection, but maintaining a sense of responsibility and integrity to Army Aviation is your duty alone.

No thinking aviator would undertake a cross-country flight without proper navigational charts. Sometimes, however, a chart can be a safety hazard if not handled properly.

Once in the air and on his ferrying mission, the pilot relaxed for the journey ahead. He placed his chart on the seat beside him. The left door had been removed prior to flight, which allowed the wind to whip his chart about. Unable to reach the chart, he decided to land rather than continue without it. During the approach to an open area alongside a highway, the aircraft struck a wire. The pilot was lucky: he suffered only minor lacerations on the head and face.

Preflight inspection varies with different types of Army aircraft. Having proper and adequate lighting for takeoff and landing is always necessary, re-

### Chart loose in bubble





### **Improper runway lights**

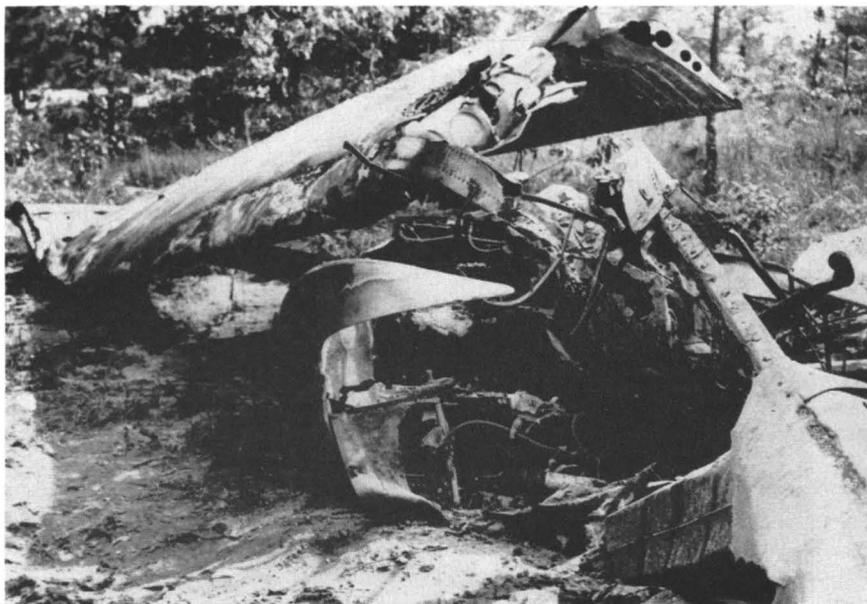
ardless of type of aircraft.

The flares for a takeoff strip would not burn because they were overfilled with oil. A Bird Dog pilot, waiting for takeoff, used the lights from two vehicles and began his takeoff roll. Shortly after takeoff, he experienced partial engine failure and made a 180 back to the strip. On nearing the strip, lights from the vehicles reflected off the frost onto the aircraft windshield and caused a diffused glare which blinded him. As it touched down, the Bird Dog

struck a metal runway boundary marker, which caused a tire to blow out. Settling to the ground, the aircraft slid across the runway and came to a crippled rest. The cause of engine failure was undetermined, but had the runway been adequately lighted, it can be reasonably assumed that his aborted takeoff would have been successful.

The aircraft had cleared the runway and had begun a normal climb when it assumed a steep climbing attitude. At 100 feet altitude the aviator removed his takeoff flap setting and attempted to lower the nose. Unable to accomplish this, he retarded the throttle, leveled the wings and, deciding he had insufficient runway ahead for a landing, made a rudder turn to the right. Nearing the ground, the aircraft went into a spin.

### **Bracket lodged in elevator bell crank, locking control**



The right wing struck the ground in such a manner as to flatten the spin so the Bird Dog came to rest upright, sliding backwards.

The pilot and passenger scrambled dazedly from the aircraft only seconds before the gas tanks exploded and engulfed the Bird Dog in flames.

A check of the accident disclosed that a small bracket, used to secure the radio guard in front of the rear seat, had lodged in the elevator bell crank in such a way as to allow free upward movement but to sporadically lock the control against downward movement.

Sometimes a person performs a routine duty so often that it seems like second nature. He begins to take things for granted—often with unpleasant results.

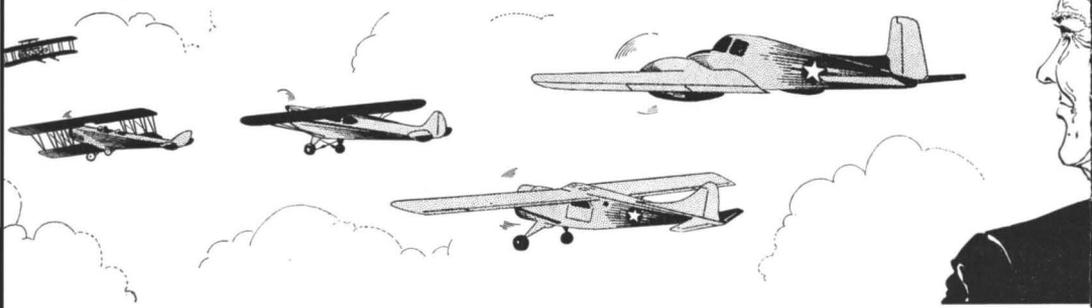
The test pilot entered the running whirlybird and made a regular pretakeoff check. The Sioux was raised to a hover and responded a bit more abruptly than was normal. Reaching an altitude of about 3 feet, the aircraft immediately began a rapid

turn to the left, accelerating as the turn progressed. The pilot applied full right pedal but got no response. As the tail swung by, an observer heard a noise similar to that caused by holding a piece of paper into an electric fan. The aircraft was airborne barely 5 seconds before it was grounded. Subsequent investigations revealed that after changing the tail rotor blades, the mechanic started the helicopter. Then the pilot entered the running aircraft without a preflight inspection. As a result, he did not learn until too late that the tail rotor blades had been installed in reverse.

If you are an aviator who would like to continue your flying career with an accident-free record, devoid of headaches, embarrassing situations, and possible bodily harm, beware of omitting that all-important preflight. Rules to prevent omissions are stated simply and concisely for each type of aircraft. On the other hand, if you're in too big a hurry for accident prevention, just *kick the tire and light the fire.*



# GROW OLD ALONG WITH ME



**R**ECENTLY I TOOK what I am sure is my last flight as a pilot of a military aircraft. I was a member of an outfit which was eliminated in the defense expenditure cutback, and I have ranked and aged myself out of active reserve duty. I would be less than human if I did not at this time look back on my years of flying and try to evaluate the factors which operated to keep me alive, as well as those mistakes which might have killed me.

I felt a resurgence of the impulse to buttonhole the boys and girls just beginning, whether in private or military flying, and say the magic words which will keep their bones intact, and send them home each evening, a joy to spouse and children.

I can say what I have to say without pride or arrogance, because I was a mediocre pilot. I learned slowly; I was not by any

stretch of the imagination a "natural." My awareness of my limitations, I am sure, is one important factor to which I owe my life. I did not have the skill to toy with chance and stretch my craftsmanship beyond its capabilities. I would not slow-roll at less than five thousand, because I scooped out at least half the time; nor would I practice spins unless I had so much altitude that the ground seemed as remote as the moon.

There are two kinds of pilots who get hurt: clever ones and poor ones. The clever ones gradually acquire a confidence which may mislead them, and tempt them to cross the safety margin once too often; the poor ones are merely incapable. But there is one common attribute which both types possess: they lack imagination. Their thinking is narrow; they fail to consider the possible consequences of a breach of flight discipline, or an overextension of their abilities.

They assume that all condi-

---

*This article first appeared in AIR FACTS magazine.*

tions at all times will be normal. They assume that the ground is flat without obstructions, that the old altimeter setting is good enough, that there is no other plane in the air, that the weather will hold, that the obsolete chart is reasonably accurate, that the fuel tank was topped, that the field is open, that the mags will clear in the air.

### CHANGE CONSTANT

These are foolhardy assumptions, resulting from laziness and wishful thinking. If there is one thing we can be sure of in this journey through the cosmos of this thin-skinned pea of an earth, it is that change is constant, nothing is ever the same. It is apparent to me that the human race is invincible. You need only consider the fact that a man who knows he has only one life to live will offer it to eternity because he is too lazy, or too unimaginative, to take an extra minute to ask a mech how much oil was put in. Courage like that exceeds the tiger's.

I distilled a single rule from the potpourri of experience, a rule which contains just about all there is to flight safety. It is, however, a mere phrase, unless we extend it through every flight activity. It is simply, "Never take anything for granted."

There are plenty of things which we are forced to take for granted without adding to the list. We must accept the evidence of our eyes and nose that the liquid in the tank is aviation gas, that the length of the runway is 8000 if RaFacts says it is, and that the propeller is pitched at the proper angle to pull the

plane forward. We lean heavily on properly trained authorities for vital information, and if they fail us we cannot help it.

But there are those factors which can be checked personally, which should never be taken for granted. I learned one lesson fairly early, and the nearness with which I came to killing, not myself, but another pilot, had an extremely sobering effect.

I was lined up on the runway's center-line with a student under the hood in the rear cockpit, preparing for an instrument takeoff. Another plane was lined up in front, for the same purpose. My student was on the brakes, ready for full throttle when I gave the order. While I could not see over the nose of my plane, I did observe the wings of the first plane recede and disappear as it started down the runway. After a decent interval I told the student to roll, and I stayed on interphone to advise and correct him. He did so, and a few seconds later my guardian angel stepped in.

"Now look, buttonhead," he said to me. "The first plane started rolling, and you figure that he is airborne at the end of the runway by now. But you don't see it. You're just taking it for granted."

I popped the hood, took over, hit the brakes and throttled back. My aircraft stopped twenty feet short of the number one plane, which had aborted, probably because the student was veering off heading. I would unquestionably have chewed through at least one cockpit if I had continued. I would have had a memory very uncomfortable to live with.

I owe to a certain vice of mine a good bit of the credit for the fact that my wife was cheated out of ten thousand dollars of NSLI insurance: I am an experience thief. I steal the experience of others.

### EXPERIENCE EXPENSIVE

Your own experience is the worst possible teacher, despite the famous dictum. It is much too expensive. I enjoy the nasty habit of appropriating that of other pilots. Every time I read or heard of an accident I would ask myself: "Do I fly in such a way that it could have happened to me?" If the answer was yes, I did my best to correct my habits. Like a parasite, I stayed alive on the flesh and blood of others, and I admit it without shame. I love the taste of hamburger with catsup and onions, and I love my wife's embrace in front of the fireplace on a fall evening. My imagination is a vivid one, and when I fail to see the other plane in the traffic pattern when tower informs me it is there, I panic.

No more hamburger? No more kisses? The cold sweat breaks out, the right hand crooks convulsively for the rip-cord handle. No more baseball with my boys? The heart beats faster. The blood pressure rises. No more cans of beer on a hot afternoon? The breath comes short and hot.

Where in the hell is that other plane?

I turn right and left to seek it. I drop first the right wing, then the left.

Tower: "Nine zero four, are you having difficulty?"

Oh, no. How can the thought of a mid-air collision at a thou-

sand feet suggest difficulty?

I make my voice calm. Nobody must know that I am afraid of a mid-air collision. After all, am I not a pilot?

"Tower from 904. I do not see the number one plane. What is his position?"

Tower: "He is over the end of the runway on final. You are number one to land."

"And how did it go today?" Cynthia says as the church key bites into the can of cold brew.

"Very nice," I answer. "Do you think it is chilly enough to light the fire?"

I knew two pilots whose tragic exits I was able to predict. One was a clever man, with an enviable skill and a superb practical and theoretical knowledge of aerodynamics. The other was a wise guy.

### CASEY THE ACE

I loved Casey, the first one, like a brother. He taught me much about flying, and he was for me St. Exupery and Jimmy Doolittle rolled into one. But he couldn't subtract. He didn't know when his units of safety were reduced to a dangerous minimum. His skill was his murderer.

He could roll at two hundred feet and never scoop out. His aircraft was as his own body. This is a fine thing, but there are possibilities over which your skill has no control. Engine failure is one of these, and engine failure when inverted at two hundred feet is a troublesome event. A parachute is useless, and your choice of pasture is severely limited, even if you complete your roll. Casey did not complete his, and scattered gas, guts, and gaskets over five hun-



**Do I fly in such a way that it could happen to me?**

dred feet of ripening corn.

I was such a mediocre pilot that I never had the courage to attempt such intrepid maneuvers. I mourned the death of Casey, but my grief didn't help him. He has been long gone, and I am here tonight, as I write, watching the scarlet leaves of the maple drift by my window in the moonlight. And yet his craftsmanship far exceeded mine.

Marvell said it three hundred years ago:

"The grave's a fine and private place,

But none, I think, do there embrace."

But I love to stunt. You should see my triple sequence: the split-S, loop, and Immelman, coming out right on the original

heading. I start it at ten thousand feet. I'm very proud of it.

The other pilot I shall call Grant. He was a likeable youth, but he lacked humility. He wore his cap on the side of his head, and made sharp turns to a landing. He would argue aerodynamics with pilots who had more hours of night flying than he had altogether. Can you imagine yourself advising Saint Ex on the best route to Dakar? Grant could have done it.

One day I said to him, after a particularly disheartening discussion (I think he was insisting that a plane in the air would weather-cock): "Grant, it matters not to me whether I win the argument, but if you fly like you talk you will kill yourself."

He snorted, re-tilted his cap to a more rakish angle, and stalked off whistling, "Off we go, ta-ta-ta-tum-tum-tum-tum."

I had no car, and he picked me up every morning to drive to the field. One Monday morning, two weeks after my melancholy prediction, he failed to show, and I had to hitchhike. No bus.

The CO was on the phone when I loped in, an hour late. I was nervous and furious; we were flying a very tight schedule. I started blabbing when it was apparent that the CO was waiting for somebody at the other end.

"That damn Grant didn't pick me up this morning! It ain't my fault!" I pounded on the desk.

The CO started talking on the phone, and being versatile like Caesar, wrote a note for me on the pad.

"Grant was killed yesterday."

I had the psychic feeling of inevitability you sometimes get in a poker game when the card you draw is exactly what you expected. Of course, I said to myself. What else could it be?

He had his brother, a visiting cadet, in the rear seat when he pulled the wings off the trainer over Biscayne Bay. The only two boys in the family. And what did his mother think, I wondered. And what did his father say?

It is the same as in driving a car, of course. In tonight's paper is a picture of a new car a boy shattered against a tree on a sharp turn. The speedometer stopped at 110. My wife is a cautious driver; too cautious, I tell her. She misses golden opportunities to pass other ve-

hicles while I fret and fume. You should estimate relative motion better than that, I tell her.

But who skidded off the road one evening and messed up our family wheels in a stump-filled ditch? You know who.

I said that Casey didn't know how to subtract. I referred to my formula for safety. According to my ingenious reckoning, safe flight is maintained only when you stay above a certain number of what I call safety units.

When you have trouble in an airplane, there are at best a fairly large number of life-saving alternatives. As far as I am concerned, there are more of them in the air than on the highway, where an oncoming car on your side of the road, passing on a curve, may reduce your alternatives to almost zero. These units are your treasure, money in the bank, the buffers against chance, fate, bad weather, or even your own fallible judgment.

What are the hazards for the private pilot? Briefly, they include engine failure, radio failure, bad weather, and structural failure. There are dozens of others too remote to worry about. Your passenger may go crazy and club you with a wrench, or your tail may fall off, but you don't worry much about it. Structural failure is infinitely less likely than a front-wheel blow-out in an automobile. That leaves engine failure and bad weather.

You reduce the possibility of engine failure, of course, by good maintenance. If it does happen, and you have altitude, that is the

money in the bank, the safety unit. Into the wind, and there you are on the ground, with at most torn fabric or a busted prop. But no disaster. If you don't have altitude, if you have been barrelling up the canyon at a hundred feet for kicks (or to get a buzz, in the language of my sixteen-year-old hotrod), you have no money in the bank. Your check may bounce.

And what about weather? Your money in the bank is fuel, a knowledge of alternate fields, and an intense admiration for the 180 turn. If, however, you have let your wishful thinking take over, your famous last words may be, "I thought I could make it."

No business appointment, no sale, is worth trying to race a front to the destination you insist on making. When the hangar-flying drifts around to hairy stories, be proud that your narrative is too dull to relate. Let nothing happen to you worth

telling about. Go thou and grow old and stodgy. Get your excitement empathically by observing the curdling exploits of Jimmy Stewart and John Wayne on the magic silver screen. Titillate your wife by an impassioned account of how the manager of the airport grill threatened to arrest you when you tried to kick your dime back out of an empty candy dispenser.

Now I am a private pilot only. I look forward to dancing the skies on laughter-silvered wings, to winging to my destination in a safe, straight line, far above the twisting hazards of the increasingly expensive highways. There are no toll-roads up there in the blue, no bill-boards on the clouds, no speed traps, no traffic lights. There is only the challenge to my imagination, and to my good common sense.

I must finish now. The ashes are glowing in the fireplace. Cynthia has the coffee on, and I have marshmallows to toast.



# Invisible Wings

Dorothy Johnson

THE PRETTY YOUNG WOMAN was calling Operations while her guests waited to sit down to dinner.

"Any news yet?" she asked anxiously into the phone.

Yes, there was news. She got her answer: bad weather . . . sorry . . . RON.

Did she return to her guests angry? Did she complain? No—she shrugged, smiled philosophically. No get-home-itis for this girl's Army Aviator husband. *He* didn't have to take chances and risk his life to keep her happy. She knew that if he could, he'd be there.

She was wearing her wings.

Another woman, mother of three, listened while father and some buddies considered the possibility of split-essing an Otter (no hands, ma!) While the stories of wild adventures got wilder, she quietly found a back issue of ARMY AVIATION DIGEST containing a particularly wise article about aircraft capabilities. She left it open on her husband's bedside table, where he'd find it.

Spoiling the show? Taking the doggone joy out of flying?

No. She was wearing her wings.

They say a woman's work is never done. Well, the wife of an Army Aviator is never *off duty*.



---

*Mrs. Johnson is a major in the WACRES. The author of many short stories, books, and articles, her knowledge of aviation is derived from her role as the wife of an Army Aviator.*

Those invisible wings are pinned to her the moment her husband gets his! She wears them just as surely as she learns to peer at a low ceiling or thunderheads with a speculative eye.

The question is: How *well* does she wear her wings?

One of the proudest, most frustrating, exciting, and worrisome things that can happen to a woman is to marry an Army Aviator—or to have her husband become one!

Why? Simple:

*Proudest* because he is "special"—special training apart from his own branch, special capabilities, and a special, indefinable dash that is part of an Army Aviator!

*Frustrating?* Well, sometimes. There are those long waits for him to return from a flight, the parties missed, the dinners spoiled. Also, a woman married to a man who flies has a rival—his plane. Wives who wear those invisible wings know this, and accept it. It is part of being married to a man not earth-bound.

*Exciting?* Obviously. Perhaps you were with him to watch his growing confidence as he progressed through flight training. Remember how you almost burst with relief and joy when he finally made it? There he was, graduated, an Army Aviator! It's exciting to have him hover over a field in a half-million-dollar helicopter and know that it's *your* clever husband handling the huge, complicated machine! It's exciting to see him skim away in an L-19 Bird Dog!

And the biggest excitement of all is the realization that he—and *you*—are part of the fas-

cinating, important field of Army Aviation!

But what about the *worrisome* aspects? Well, whose life doesn't have some worry? There are some special concerns in the life of a flier and his wife that aren't the same for a career in research or business. It has occupational hazards; it requires courage and sharp thinking. And because these demands are made of your husband, they are also made of you. Remember, though, your husband chose you because you *could* wear those wings!

Still . . . what of those few who make mistakes? What of the man who picks a girl who can't understand that flying is a highly demanding profession? What about the wife who never realizes that flying often requires every bit of concentration at the pilot's command?

If she has sent him off for the day from a quarreling house, it might be the distraction that makes the difference whether or not he comes home safely that night. Perhaps that never occurred to her; perhaps it will now.

Naturally, in wartime a pilot doesn't fly with peace of mind; he gets plenty of distractions. But those battles are sometimes easier to endure than the emotional ones fought in a warring home.

So, the wife who wears wings considers the emotional climate of her husband's life, as well as the weather for the day. Flying safety *must* be underwritten at home. Army flying is unforgiving of mistakes and carelessness.

The wife of an Army Aviator can do much to keep her husband safe. It may be as basic as

starting him off on a flying day with a substantial breakfast. If his personal fuel tank is full, there is less chance he will falter some midmorning when a second could mean his life. Scientific reports show a slump in reaction time when the body is improperly nourished.

Army Aviators are intelligent men; they have to be. They want wives who can talk to them intelligently about the main interest in their lives—flying. A tactful (and wise) Army Aviator's wife would find it rewarding to learn something about *what* he does—the rudiments of how planes fly, and some of the tech-

nical language.

Then must the wife do all the understanding, waiting, adjusting? Of course not; marriage is still very much a two-way street. Consideration continues to work both ways. However, if the wife of an Army Aviator fails him, all the expensive training and equipment the government provides is undermined . . . and might well prove useless.

So, if you are the wife of an Army Aviator, the next time you look at those silver wings he wears, remember your own invisible pair. Are they bright—or are they tarnished from disuse?



## Schools Can't Do It All

**A**RMY AIRCRAFT ARE MADE to go faster, farther and higher; they are larger and more complicated; auxiliary and communication equipment crowd cockpits with an ever-greater complex of dials and knobs. Every aspect of Army Aviation is in a rapid state of growth—everything, except the human element.

Shifting responsibility is one human quality that requires no psychology to understand and recognize. Any performance other than perfect always seems better fitted to other shoulders than our own. Army aircraft accident investigation boards are no exception. Responsibility for cause factors in the field of training is frequently shifted back to the U. S. Army Aviation School by such comments as:

"The school should stress crosswind landing technique."

"The school should stress pinnacle operations for cargo helicopter qualification."

"More time should be made available for instrument training at the school."

"Formation flying should be taught at the school."

"More night cross-country training should be given by the school."

Where does school training end and unit training begin? What should the newly graduated aviator know when he reports to his first assignment? Authorities in all fields of education have long stressed a tenet that should answer these questions. These learned men say: "No school can train its students to be highly proficient in

any particular skill. Students would have to remain in training too long. Schools must provide instruction in the fundamentals of the skill and sufficient practice to provide a sound basis on which individual experience can build greater proficiency."

A commanding general, in reviewing an aircraft accident report wherein the Board had recommended additional schooling as a corrective action, commented quite appropriately:

"Slipshod performance of duty will not be remedied by schooling. Schools only teach how; they do not impart responsibility. This latter is obtained only by an effective chain of command that permits no dereliction. The pilot alone is not responsible."

The newly graduated aviator should have the basic knowledge and skill to support a growing proficiency. Guidance and opportunity to build experience must be provided by the unit. This tenet implies no shift of responsibility from the school for supplying basic knowledge and skill. The U. S. Army Aviation School recognizes the need for improvement in all aviation courses. The program of instruction is under constant evaluation and alteration to fit the growing needs of Army Aviation. Suggestions from using agencies are welcomed and given careful consideration.

Accident cause factors are of preventive value only if they ac-

curately pinpoint areas in need of change. Shifting responsibility, without thorough analysis, will not isolate these areas. Some questions that will help to determine where training deficiencies originate are:

Are unit instructor pilots qualified to instruct, or is it a convenient way for two pilots to log time?

Is the training schedule carefully planned and followed?

Are unit weak points known? Is practice concentrated in those areas?

Are new aviators given priority for aircraft assignment?

When these questions are satisfactorily answered, there remains one other important truth that must be recognized by all: The newly graduated aviator is not ready for the ultimate. He is not a professional. He cannot assume a mission that requires maturity of judgment and top-level skill. This capability comes with careful preparation under the strict guidance of older, more experienced aviators. It is not enough that a soldier is given an airplane; he must also be taught to use it. The school has given him a sound basis for further training which must inevitably come from experience in the unit. If his experience is not broad enough to cope with the problems of the mission, an accident results. It is as simple as that. Proficiency training must come from the unit.



*Memo from*



## *Flight Surgeon*

**I** BELIEVE if I had been thoroughly rested the accident might not have happened." No one can disagree with this pilot's analysis of his accident, but wouldn't it have been better if he had said, "I believe I need a rest so an accident won't happen"?

A pill or a jug of coffee can't take the place of an aviator's 8 hours of sleep any more than a tablet dropped in a fuel tank can serve in lieu of adequate maintenance. The Army Aviator is a complex machine system, too, who needs down time.

The accident mentioned above was a flight into weather in the Chickasaw. It was charged to pilot error, but the error was not so much in having the accident as in taking the flight. On departure from the field the pilot was known to be tired and irritable. He did not appear as alert as he should have been. He was observed to enter an area of thunderstorm activity, make a 180° and then re-enter.

In the preceding 24 hours this aviator had flown 8 hours. The remainder of the time was used in waiting for weather, which was marginal, waiting for servic-

ing, and going to and from the flight strip. At the time of the accident he had slept only 4 hours in the last 24 with only 7 hours in the last 48. It had been more than 12 hours since his last full meal.

On the same day three other aviators had about the same amount of sleep, with a correspondingly lowered efficiency. These pilots were grounded by their flight surgeon.

Lack of sleep is as bad as a hangover. Concentration is reduced and forgetfulness increases, or you may just plain "pull a boner." For example, another pilot worked all night and went flying the next morning with near-disastrous results. After flying for several hours he made a careful downwind pattern and on final "wondered why those jerks were taking off toward him." The errors of coordination and judgment are killers that are usually unrecognized until too late.

Tired pilots take longer to calculate corrections, and in today's aircraft faulty reaction time may be fatal.

The pilot is the first to know when his eyes are becoming too

heavy for maximum performance. It is much more pleasant to see the flight surgeon in his office than to face him in the accident board investigation.

Instead of a pick-me-up, ask your flight surgeon for a check-me-up.

\* \* \*

The familiar carbon monoxide bogie is a particular friend of Old Man Winter; personnel trying to shut out chilling ventilation from outside air invite carbon monoxide in. Even small sources may build up to toxic levels in closed living spaces, vehicles, and generator rooms. Carbon monoxide can smother you before the danger is realized.

\* \* \*

Ground resonance is a violent lateral oscillation (U. S. ARMY AVIATION DIGEST, April 1958) which may affect certain helicopters just prior to landing. It can leave pilots in somewhat the position of dice in a shaker.

The Choctaw touched down, commenced to sway, and went into violent oscillation, with forces so extreme neither occupant was able to keep his feet on the rudders nor hands on the controls. At the peak of the oscillations the helicopter tipped on its side, and the aviators climbed out.

The copilot had cuts above his shoe tops. The pilot reported the motion had been so violent his vision blurred. Both helmets showed indentation and scratches from bumping against each other.

The copilot was wearing gloves, flight suit, winter jacket, and helmet. He stated the cloth-

ing lessened his bruises and that the helmet saved his life. He also said, "Without shoulder straps and safety belt being on and tight, there is no doubt that the accident would have been fatal." A motion that violent probably would have thrown both aviators out. A good argument for full use of available safety equipment.

\* \* \*

Aviators who use full white lights in cockpit prior to takeoff retard dark adaptation of their eyes, which is so necessary over cities in high density traffic areas. The use of full red lights and as little white light as practicable will materially aid in observing traffic soon after take-off.

\* \* \*

"A little nose cold" can be a dangerous thing.

In general, people with colds, sore throats or tonsillitis should not fly.

In an emergency, colds or no colds, the planes go up, but in ordinary routine operations, the grounding of personnel with colds is a sensible precaution to protect them from further complications.

Besides a stopped-up nose, runny eyes, and the general feeling of not being up to par, the major difficulty experienced by personnel flying with colds is being unable to clear their ears. Especially in descent, this can produce pain, temporary deafness, ringing in the ears, and occasionally vertigo; if not relieved, injury to the eardrums and possibly subsequent middle ear infection can result.

# PUZZLER



**T**HE 20TH DIVISION has been actively engaged in combat for the past 27 days, and is now mounting an offensive with 3 battle groups on line and 2 in reserve. The main effort is on the left. The division is expected to continue the offensive for the next 7 days. The Aviation Company is at full strength in personnel and has the following aircraft available: 5 Beavers, 12 Bird Dogs, 18 Sioux, and 8 Iroquois. Disposition is as follows: combat support flights are with BGs, artillery flight is attached to Artillery and is 2 aircraft short, and target acquisition section is operating from a division CP strip and is short 1 Bird Dog. The command support section is operating from the division CP strip and is short 1 Bird Dog and 1 Beaver. The tactical support section has one Sioux with each of the following organizations: 1/61 BG, 4/64 BG, Signal Battalion, Engineer Battalion, Armored Cavalry Squadron, Medical Battalion and Tank Battalion. The remainder of the section is located at the division CP with 1 Sioux at base airfield. The section is 2 aircraft short. The utility section is located at the base field, with priority going to the 1/61 BG and the Armored Cavalry Squadron in that order.

You are the 20th Division Aviation Officer. You have just been notified by a message from Army that effective immediately all Sioux helicopters are grounded for a safety of flight modification. The period of grounding is estimated to be from 3 to 5 days, until kits can be received and installed.

Indicate by a  what your actions and/or orders are at this time.

- a. This is a safety of flight modification; all of your helicopters are functioning satisfactorily, and you feel the combat situation at this time warrants the continued use of these aircraft. You decide to overlook the grounding order and perform the safety of flight modification as time and situation permit.
- b. Notify the G3 of this message and ask him to call Army to see if anything can be done to keep the helicopters flying because of the combat situation.
- c. Disseminate the grounding order and recommend to the G3 and Chief of Staff that 5 Bird Dogs be attached to the 5 combat support flights for the duration of the grounding (3 aircraft from the artillery flight and 1 each

*(Please turn to page 21)*

# Fly Better Through Discipline

William E. Vance

**D**ISCIPLINE CAN MAKE you a better aviator and a better soldier. Discipline can improve your leadership qualities and lend assurance for success in your career. Discipline can even save your life!

This is a true account of an incident in the day of an aviator. A young aviator flying over water experienced engine failure while at 4,000 feet. He checked the fuel selector switch, transmitted his emergency report on guard frequency, turned the fuel boost on, enriched the mixture, and pumped the throttle. Nothing happened. At 1,000 feet he placed the mixture in idle-cutoff and held the primer down. The engine began to fire intermittently, and at about 100 feet above the water began to run well enough to maintain altitude. Still on primer, a slow climb was made to about 300 feet and the mixture put in full rich position. At 900 feet the engine quit again and failed to restart on the primer until the lieutenant jettisoned the canopy and belly tank, prepared to ditch and was down to 10-15 feet altitude. Again on primer and

then with rich mixture, he climbed to 1,400 feet, where for the third time the engine quit. This time it started quickly on primer; then with the mixture in normal, a climb to 6,000 was made. He flew the airplane to a small dirt airstrip in the area and made an emergency landing.

The raconteur of this story did not state the cause of this engine malfunction. However, the important point of the story is clearly readable between the lines—the effect of discipline on an aviator in difficulty. Only through stern self-discipline could the pilot have brought this off as he did. The files contain many case histories of accidents and near-accidents by aviators with an implication of discipline or the lack of it as a contributing factor. Where would you stand in a test of this nature?

What is the difference between an emergency that turns into an accident and that which remains an incident by virtue of training, coolness, and quick action? Discipline is the only answer. When discipline rides the cockpit, the aviator has a better than even chance of get-

ting himself, his airplane, and cargo or passengers safely on the ground.

What is this thing called *discipline*? Military discipline is that mental attitude and state of training which renders obedience and proper conduct instinctive under all conditions. Notice that "all conditions." This also means at a time when there is no one at your shoulder telling you what to do and how to do it. Self-discipline is the foundation of military discipline. It starts with you, and it ends with a quick proud unit that can get things done.

#### **BENEFITS OF DISCIPLINE**

Strict discipline is a benefit to every aviator. Before becoming one, you may have doubted this or neglected to give it much thought. Yet, when you landed solo in your first tight situation, your discipline during training assured a safe landing capability. Discipline or not, old aviators can be careless. Ever run out of gas over a swamp or very rough terrain because you checked the Form 781 instead of the tanks? OK, so you're lucky, but it has been done.

This letter, to a friend back home from a young lieutenant in Korea, concerns a noncom who brought his squad through a number of bitter battles: "This man is not much; he wouldn't fit in a church social, but he's worth a hundred. What control he has over his men. You can sense his sureness in everything he does. He is not soft and not sociable, but his men respect him. In his bunker, weapons are in neat order and so is everything else. You may laugh

at this, but I know today that these things are not superficial. They are expressive of the best of traits in soldierly character. Ask his men and they'll tell you without hesitating: 'That noncom's all right.' They prefer his type to the buddy-buddy because they well know that when the chips are down their life depends on his courage and energy." Does this not picture a disciplined soldier, one on whom the commander can rely?

An Army Aviator has a difficult job to do. He should be more versatile than airline pilots; he must be as efficient as the best civilians. In addition he must possess that which makes the Army different—discipline. This is difficult because even though he occupies a unique position, one that easily leads to disregard for discipline by the very nature of what he does, he can never forget that military aspect if he values his life.

#### **DISCIPLINE A HABIT**

The development of discipline is based on conscientious effort and habit. Because an Army Aviator often flies alone, the emphasis must be on self-discipline. Flying is fun but it is work, too. It is nothing less than work to hold that heading. It is work to never vary from altitude and maintain groundspeed data for position report estimates. It is work to monitor weather broadcasts while tracking a LF beam.

To protect the Army Aviator against such crises as inflight emergencies or the arrival of a bogey requires an enormous effort, namely, discipline. You must be severe with yourself. If you are an IP you must be

severe toward your student. Army Aviators are not well trained until or unless they are disciplined.

There is no officer-in-charge of discipline. It can't be served up ready-made by a special staff section. It must be obtained primarily through two sources. The first is through command channels, all the way down to the line chief. This is the most effective and the quickest method of getting discipline. The second method is in emphasis in the training programs.

Voluntary compliance with aircraft procedures, self-discipline when alone, and obedience to rules based on awareness of

responsibility cannot be forced on a man; neither can it be ensured by punishment. This discipline must be produced by training and practice, backed up by conviction. This soldierly discipline must be based on the innermost consent of the Army Aviator to meet the tasks and forms of service to his unit.

Piloting an Army airplane is no game. It is a deadly serious business that can become lethal at any moment. To hold his own, alone and isolated from his commander, the aviator needs a high order of self-discipline, born of habitual responses. The proud, disciplined Army Aviator is ready for anything that may happen in line of duty.



## Puzzler . . .

(Continued from page 18)

from the target acquisition section and the command support section).

- d. Disseminate the grounding order and notify and recommend to the G3 and Chief of Staff that the BGs on line (1/61, 2/62, 3/63) have attached to their combat support flights 1 Iroquois and that 4 Bird Dogs be detached from the artillery flight and 1 each attached to the combat support flight of 4/64 and 5/65 BGs and 2 attached

to the tactical support section until the modification order has been accomplished.

- e. Order the Aviation Company Commander to ground the Sioux and attach the following aircraft: 1 Iroquois to the combat support flights of the 1/61, 2/62, 3/63, 1 Bird Dog to the combat support flights of the 4/64 and 5/65, 2 Bird Dogs to the tactical support flight until the modification has been complied with.

The recommended solution to the PUZZLER may be found on page 25.

# Prone to Err?

Pierce L. Wiggin

ARE SOME HUMANS really more prone to have accidents than others? If so, does this apply to aviators? These two questions have plagued the experts for many years. Numerous studies have produced endless pages of text, figures, and graphs to prove and disprove this theory.

In one book about accident prevention, we find: "Basic causes of accident proneness were determined. In some cases, these were medical, in some attitudinal, and in others lack of information and training."

Can we then say an aviator is accident prone because some medical factor renders him physically unqualified to safely perform his mission? Or should we look to our medical supervision, education, and discipline? Which would be most likely to prevent such an aviator from causing an accident?

Can we say that an aviator is accident prone because he fails to comply with regulations? Or should we look to his commander for the leadership that provides discipline and high morale? Which of these would most likely prevent such an aviator from causing an accident?

Can we say that an aviator is accident prone because he lacked information and training? Or should we look to the school or unit that provides information and training? Which of these would prevent such an aviator from having an accident?

Wading through another text, we find: "The term 'proneness'

has been widely used to imply a series of personality traits or a syndrome that remains to be precisely identified. Two of the basic problems involved are: (1) whether there are important differences between individual pilots in regard to their accident liabilities, and (2) whether methods can be devised for detecting those individuals who are especially liable to an accident.

"In general, the search for characteristics of those who may turn out to be poor accident risks has not met with success. The evidence in support of identifying traits comes from two fields of study: (1) the results of psychological tests of various kinds administered before employment and (2) clinical studies, involving interviews and/or case histories of individuals who have been involved in repeated accidents. The evidence from the use of tests is far from convincing in either military or civil aviation, and usually the clinical approach must wait until after the individual offender has identified himself very clearly by having a large number of accidents. Further study is needed to help identify adverse traits in experimental as compared with control groups in order that

---

*Mr. Wiggin is Chief, Literature Division, United States Army Board for Aviation Accident Research. He flew P51s in World War II and instructed at the USAAVNS prior to his present assignment. He has a total of 7,500 flight hours.*

better predictive results may be obtained."

The text in current use by the University of Southern California for instructing the Army Aviation Safety Course states: "The existence of 'accident proneness' in general must be considered still an open question. It is evident that even if it does exist, it is not likely to be a very important factor in causing flying accidents, or at least it will be involved only in very rare instances. In any event, the biggest part of the flying safety job is to prevent the first accident."

We asked the simple question: "Is there such a thing as accident proneness?" These were the answers we found. Stripped of their foliage of excess verbiage, they all amount to the simple answer: "We don't know!" The extent of variables makes it unlikely that a satisfactory answer will be found in the future.

Why then should aviators be grounded by evaluation boards on the basis of accident proneness? There is no doubt that aviators who exhibit undesirable physiological or psychological deficiencies that have caused accidents should be evaluated and grounded if the evidence from a particular accident or accidents reflects these deficiencies to an extent that cannot reasonably be corrected. They should not be evaluated or grounded because of the unproven and unknown quality—accident proneness.

The above portion of this article was sent to the Aviation Safety Division of the University of Southern California for review by Dr. Glenn L. Bryan,

Aviation Psychology Instructor, who had this to say:

"I personally question the validity of 'accident proneness' . . . So, I was pleased with the central point of this article. I agree that one of the principal drawbacks to the concept of accident proneness is that it is a dead end . . . it doesn't seem productive to say that a man is accident prone, and then let it go at that. And, it doesn't seem to add much to contend that you know he is accident prone because he is careless (for example). After all, carelessness can be combated directly (and I haven't any idea how one combats accident proneness).

"Generally speaking, there is abundant evidence to indicate that the concept is an oversimplification. It is probably an artifact of our thinking habits. It fails to take into account the fact that there are many different types of accidents. It depends upon the existence of stable, unitary patterns of personality traits which haven't been found.

"Finally, I sometimes fear that the concept is misleading to the average Army Aviator. It may lead him to think that there are kinds of people who have accidents (i.e., the accident prones)—and some that don't (the normals). He misdirects his attention in a search for two-headed monsters, who have two left feet, and are all thumbs. This can be very comforting. It can lull pilots into a state of complacency. It is a siren song. It seems to me that the facts are to the contrary. The great bulk of accidents that occur in military aviation happen to people

like you and me. They happen to the normals. It is extremely important that the aviators understand and accept this view. Our real problem is to determine what makes the normal pilot have an accident. Our real opportunity for progress lies in that direction, not in a fruitless search for a pilot who is accident prone."

### PREVENTION BY DIRECTIVES?

Can aviation accidents be prevented by directives which imply penalties and punishment for failure to conform to desired performance? The answer must be emphatically no! Aviators are in a position that demands total concentration while piloting aircraft. Unlike other soldiers, Army Aviators cannot stop their machines at will and take stock of any given situation. They must constantly plan ahead of their machines and be conditioned through training and experience to meet any flying situation which may confront them.

Fear of recrimination will not free an aviator's mind for demanding tasks. Moreover, this fear, through its distraction, can be the cause rather than the prevention of accidents.

This does not imply that separate investigation of accidents by immediate commanders should not be made when facts appear to indicate breach of regulations or culpable negligence. In such cases, disciplinary action is called for and should be made. However, this disciplinary action should not be permitted to become a "Sword of Damocles" hanging over the head of Army Aviators. Fear of this type will surely affect performance of the

Army Aviation mission. "Before the fact" discipline results in behavior traits which are usually manifest in those accidents in which human error is a cause factor resulting from distractions or lack of proficiency. Distractions and lack of proficiency will result from fear of recrimination.

Tactical flying, by its very nature, is inherently conducive to risks greater than those involved in other types of flying. Fear of recrimination can so influence aviators that these risks become unacceptable. When this occurs the mission suffers through failure to exploit to the full the capabilities of Army Aviation.

A far more effective method for aviation accident prevention is to improve the mental outlook of aviators through good morale and discipline. Group behavior is a complex pattern of interaction which is different from the sum of the behavior of the individuals in the group. Because aviators belong to a group, individual aviators react differently, sometimes capable of greater effort and often less concerned about personal security because the goals of the group require him to be.

One of the most important aspects of group activity is morale. The achievements of athletic teams, committees, and military units have consistently been related to the level of their morale. It is easier to say what morale does than to decide what it is. Good morale makes aviators want to do what they have to do; good morale enables the individual to work enthusiastically and energetically; good

morale causes the individual to pursue actively the goals of his group, even to the point of subordinating his individual goals; good morale is the basis of self-discipline; good morale increases the effectiveness of group activity; and good morale gives a

sense of well-being and confidence.

Good morale, adequate medical supervision, and continuous training are keys that will open all commands to more effective accident prevention.



## *Solution to* **PUZZLER**

On the basis of the factual information contained in the PUZZLER on page 18, the recommended solutions are as follows:

**Disseminate the grounding order and recommend to the G3 and Chief of Staff that 5 Bird Dogs be attached to the 5 combat support flights for the duration of the grounding (3 aircraft from the artillery flight and 1 each from the target acquisition section and the command support section).**

**Disseminate the grounding order and notify and recommend to the G3 and Chief of Staff that the BGs on line (1/61, 2/62, 3/63) have attached to their combat support flights 1 Iroquois and that 4 Bird Dogs be detached from the artillery flight and 1 each attached to the combat support flight of 4/64 and 5/65 BGs and 2 attached to the tactical support section until the modification order has been accomplished.**

Choices *a* and *b* are not acceptable. The required modification is a safety of flight modification and involves a question of safety. Choice *e* is not acceptable because the aviation officer has no command authority, although he does have operational control of the company. Orders are issued through the G3 section as Operation Orders.

Choices *c* and *d* are acceptable solutions because they comply with the modification requirement and furnish aviation support to the combat elements of the division, while retaining the capability of furnishing a troop lift and aviation support to the remaining elements of the division.

Choice *d* is the best solution. The principles stressed here are that the Aviation Company must be flexible in its employment and that no section, aircraft, or element is for the sole use of any one divisional unit. They must be employed to best facilitate aviation support to the division in the accomplishment of its mission or missions. The time or type of attachment to the different elements is not discussed nor the reasons for same because they depend upon a specific situation.

*NOTE: You are encouraged to submit comments to the Editor-in-Chief of the U. S. ARMY AVIATION DIGEST on the contents of this problem or on any of the material appearing in the magazine.—The Editor.*



# GRAY HAIR DEPARTMENT

**T**EMPTATION TO STRETCH your luck, rather than play it close to the belt by going to a little extra trouble or sacrificing a few minutes, is something that all of us have indulged in at one time or another.

What is this desire that impels you to scoot around the car ahead and try to get back in the right lane before meeting the approaching car? Its compulsion is often almost overpowering, especially if you are hurrying to meet the boys and lift a couple of steins before meeting the missus. What brings about this glow of pride and gleeful satisfaction after having successfully run a red light—and right under the nose of an unsuspecting policeman, too? Surely everyone knows speed limits are merely set to control irresponsible, unskilled drivers and do not apply to an expert, careful driver. Of course, the brakes may be a little slack, but . . .

Apparently there is a quirk in some people which causes them to find delight in flaunting anything resembling a regulation on their actions. Let a law or rule be made and immediately someone begins devising methods for circumventing it. Nine times out

of ten the person will succeed, too. By the same token, one time out of ten the action will backfire. Others, being less imaginative and just downright careless, simply prefer to ignore the rules. They also find themselves on the horns of a dilemma with its resultant chaos and destruction.

## WATER IN FUEL

Returning from a survey mission, the aviator set his Bird Dog down on the field and proceeded to refuel the aircraft. This was accomplished from a 50-gallon drum with the use of a hand pump. The drums containing the fuel were in very poor condition. Some had holes in them and all contained rust. The refueling was done without straining the gasoline, the funnel with chamois being located three miles away (two vehicles, however, were available for the pilot's use). The aviator had failed to check the aircraft fuel prior to departure.

Engine failure occurred at an altitude of 4,000 feet during the last survey mission. The aviator switched tanks and applied carburetor heat. He turned the aircraft in the direction of a valley that appeared suitable for a forced landing and descended to 1,000 feet. Here, the engine caught, sputtered a few seconds

---

*The Gray Hair Department is prepared by the U. S. Army Board for Aviation Accident Research with information from its files.*



**The main event occurred after the show was over**

and stopped again. The aviator prepared for a crash landing.

The small, level clearing was surrounded by heavy brush which hid from view a stream 15-20 feet in width. Making a fair touchdown, the aircraft rolled through the heavy brush and hit the far side of the stream. The Bird Dog was damaged beyond repair.

An analysis of the fuel disclosed that the first quart of fuel drained off was 100 percent water with a small amount of rust scum. Additional inspections revealed presence of water in the fuel ranging from a trace to 75 percent.

The condition of the drums containing the aviation fuel was of long standing. Repeated requests had been made to the petroleum company in an attempt to procure better drums. The aviator must have been aware of the value of straining fuel and draining fuel tanks.

Fuel is the lifeblood of your aircraft. Keep it clean!

#### **SHORT TAKEOFF**

Probably no greater thrill is experienced by man than that of an aviator soaring through the sky, watching the landscape slide away beneath and listening to the surge and throb of a well functioning engine. A feeling of satisfaction wells up inside as he contemplates his lot. He has conquered flight. Some, on occasion, miss this experience of exultation and sense of achievement because they fail to get off the ground. Or if they do, their flight is shortlived. The following story of a pilot is a case in point:

The show was over. Armed Forces Day visitors were leaving favorably impressed, their faith in Army Aviation heightened. But the curtain rang down prematurely. The main event, though unscheduled, was yet to



**Pilot used the rear seat with nonrated passenger in front**

come.

Taking off to return to its home base, a Seminole clipped the tops of some nearby trees and crashed, striking a civilian-driven automobile in the process. Miraculously, the accident was without fatalities, but damage in excess of \$70,000 was incurred. The visitors were no longer impressed, their confidence visibly shaken.

The cause factors of the accident were painfully simple. The pilot had unwisely not utilized sufficient space and maximum power for a soft field takeoff. With 4,000 feet of sod strip available, the pilot chose to use less than half with disastrous results.

That a sane person would never, without a great deal of provocation, stick his head into a lion's mouth is obvious. Still, again and again reports cite graphic examples where avia-

tors take comparable liberties with their lives. Not content with that, they also risk the lives of passengers and bystanders.

Get the most out of aviation. Make certain *you* get in the air to enjoy it!

#### **IT COULD BE A GREAT DAY**

The day was bright with a 30-mile visibility and ceiling at 5,500. Light winds swept across the airfield. A truly great day for flying.

While waiting for his aircraft to be refueled, the aviator explained the operations for rudder and control stick to his non-rated passenger. At completion of refueling, the pilot climbed into the rear seat and his passenger occupied the front compartment. The aircraft taxied on the runway, made a normal ground roll and began climbing out. Barely after takeoff, the

Bird Dog assumed a nose-high attitude and rose sharply. Reaching an altitude of 150 feet, the aircraft stalled, hung suspended a brief moment, then pivoted on the left wing onto its back and plummeted to the ground below. Striking the ground slightly to the left of the runway, the fuselage jackknifed and fire began to lap greedily at the spilled fuel.

Mangled metal made release of the occupants of the aircraft impossible. Rescuers worked feverishly to extinguish the flames and cut away the metal restraining the pilot and passenger. Both received fatal injuries.

Findings of the accident investigation board determined a possible cause of the accident to be loss of the rear control stick immediately after the takeoff (it was found lying loose and undamaged near the body of the pilot). This could possibly explain the sharp vertical climb of the aircraft in two ways: Either the passenger in the front seat froze at the control with the stick in the back position, after the rear stick came out of the socket, or the front seat slid back during the takeoff (as has happened before) and the passenger, reaching for the nearest support, probably grabbed the stick.

A contributing factor was the pilot's use of the rear seat, which is *contrary to safe operating procedure with a nonrated person in the front seat*. Also, the security of the rear stick was not checked during preflight.

Mechanical factors (seat slippage and inability of pilot to visually check locking system of stick) are the result of unde-



**Stalls . . .**

sirable design features. However, these features are known to every aviator, and until they are corrected, it is your job to make allowances and adjustments for them.

### **STALLS**

Many a scarred spouse knows the danger of stalling around when his better half demands a reason why the "short one with the boys" turned out to be an all-night affair. Stalling will get you nowhere, as many a battered but wiser mate can testify. If you start stalling with your aircraft, you will find yourself in another embarrassing and dangerous predicament—if you don't come up quickly with the right answer.

Early in flight training, Army Aviators learn that stalls are

**will get you . . .**





nowhere . . .

caused by excessive demands made on the air by a wing which meets it at too great an angle of attack. Growing aviation accident files lead to the conclusion that many either forget or ignore this fact, winding up behind the well-known eight ball; some never fly again.

The Bird Dog flew over, and its passenger dropped a message to ground personnel. Then the aircraft continued the same flight path as before. As it reached a downwind position, ground troops waved acknowledgment to occupants of the aircraft. The pilot rocked his wings and began a banking left turn. The Bird Dog continued into a very steep, 60° bank. As it reached its steepest attitude, the nose of the aircraft was seen to rise slightly, as if to climb, then drop sharply. The Bird Dog plunged at a very steep angle to the hard, rocky terrain below. Seconds after impact, the aircraft was enveloped in flames. Two explosions were heard as the battery and fire extinguisher ruptured. The pilot and passenger met instant death. It was later determined that the pilot was flying with limited experience in high density altitude conditions.

Here's another:

The flight had been uneventful prior to the power approach to the field strip. After passing over a barrier of small brush at an altitude of 25 feet, the aircraft began to settle rapidly.

The pilot attempted to recover by applying additional power. Application of power came too late and the aircraft crashed. Because of the pilot's failure to recognize a stalled condition, the Bird Dog was heavily damaged. The pilot escaped with only his pride damaged.

And another:

Lining up to land, with light and variable winds, the aviator pulled 60° flaps, using little power as the Bird Dog assumed approach attitude. As the roundout began, the aircraft stalled out 5-10 feet from the ground. The pilot applied full throttle, but the Bird Dog struck the runway and came to rest in a broken heap.

Recovery from practice stalls is easy for the experienced aviator, but this ability deteriorates rapidly without continued practice and training. Constant alertness for stall signs is a prime requisite for bringing your aircraft home in one piece.

The aviator entered traffic for landing. A normal turn was made to base and turn on final was accomplished 300 feet above ground. He applied 30° flaps and glided in at 80 mph. Being more current in heavier aircraft, the pilot anticipated a ballooning action with the extra airspeed as he started the roundout. With his vision fixed on a spot of runway illuminated by the landing light, he did not realize he was high until the Bird Dog stalled and began to settle in. Feeling the aircraft settling, he shifted his line of sight and became aware of his critical condition. He then applied full power, but the action was too late to reduce the impact of the fall. This pilot

had an erroneous preconceived idea that the aircraft was going to float, which delayed his recognition of the stall.

Stalling around with Matilda may result in no more than a verbal lashing or a few days' confinement in the doghouse. Stalling around in Army aircraft is a matter that can spell disaster. How's your technique?

### WIND: FRIEND OR FOE

'Tis an ill wind that blows no good. And many an ill wind blows no good for Army Aviators. A lack of respect for the treachery of a variable wind can knock your flight plans awry—and will, if you are careless. It is the wise aviator who recognizes the faithlessness of wind and plans his line of action accordingly. One did not:

The setting of the story is an improvised tactical strip on a gravel hard-surface range road, bordered on one side by scrub pines 10-15 feet high and on the other by telephone lines and more pines. The air section's mission was to lend air support to ground units undergoing field exercises. On the previous day, winds shifted to a quartering crosswind from the right and rose in intensity to a point that made further operations impossible. The section's two aircraft were grounded.

The next morning broke bright and clear. The wind sock indicated there was still a quartering crosswind from the right, but it appeared to the pilot to have diminished considerably from the day before. He estimated the wind at approximately 10 knots. This was his second mistake. The weather station re-

ported winds of 18 knots with gusts up to 28 knots. But then, he had not checked for a weather report—his first mistake.

After warming up the Bird Dog and taxiing out on the road, he prepared to take off. The wind, in the words of the pilot, held the direction and speed that it had since dawn. He completed the runup, checked the wind sock, and applied full take-off power. The aircraft traveled about 100 feet, broke ground and reached an altitude of about 3 feet when a sudden gust of wind from the right forced the aircraft to drift to the left. Failing to respond to application of full right stick, the Bird Dog continued to drift toward the telephone poles. The pilot reduced power in an attempt "to get the plane back on the ground or at least ground-loop a way from the poles." The left wing struck one of the poles, and the Bird Dog spun 180° back to the direction of takeoff and slid to rest with damages of nearly \$10,000. The pilot, lucky this time, was unscathed—but wiser.

Wind is usually your friend. It's an ill wind only because you fail to recognize it.

### BE A KIND TASKMASTER

A comparison of aircraft mechanism with the intricate, per-

### Wind: friend or foe





### Maximum performance demands intimate knowledge

ishable parts of the human body may at first appear a trifle strange. Actually, the two are not so dissimilar as you might imagine. Aircraft parts wear and show signs of use the same as the body. Both capabilities are limited in much the same fashion. There are certain things each can and cannot do. Aircraft can be overloaded, called upon to do jobs they were not designed for, just as human bodies are overtaxed and ill-used.

It is equally important for an Army Aviator to know the limitations of his aircraft as thoroughly as he knows the extremes of his personal capacity. Overtaxation of the Bird Dog or the mighty Mojave can be just as crippling to the aircraft as stress and strain on parts of the anatomy. Either will respond adversely if placed in a position which demands an excess of strength or resiliency.

The following account is an example where a Mojave was expected to perform the impossible under a combination of excessive demands.

With a density altitude of

1,200 feet, overloaded by nearly a ton, the Mojave took off downwind toward a tree barrier, following close in the wake of a sister ship which was creating an intense downwash. After attaining an altitude of approximately 50 feet, the aircraft began a noticeable descent. Failing to respond to additional application of power, the Mojave settled and the main rotor blades struck a tree 240 feet from the point of takeoff. The pilot attempted to land the aircraft in a small clearing among the trees, but without success.

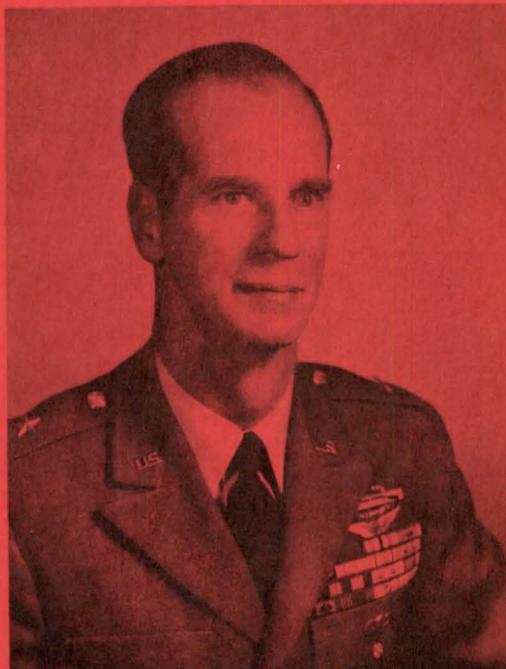
The main rotor blades continued chopping away at the trees, scattering debris over a wide area. A part of one rotor blade struck and killed a member of a nearby mortar crew. The occupants of the Mojave, more fortunate, escaped with slight cuts and abrasions. Damage to the aircraft was \$700,000.

The Mojave had been checked out and found functional, but in this case it was called upon to perform far above its realm of ability. The aircraft did what it could. Its main rotor coned drastically as additional power was applied, but it was fighting under too great a handicap, and crashed.

Maximum performance demands an intimate knowledge of aircraft limitations. How well do you know your aircraft?



## GENERAL EASTERBROOK NEW SCHOOL COMMANDANT



"My assignment as Commandant of the United States Army Aviation School comes as a great honor. With the unstinting help of Army Aviators the world over, I will aspire to build to that marvelous spirit which is characterized in our motto 'Above the Best.'" — Brig Gen Ernest F. Easterbrook

Brigadier General Ernest F. Easterbrook this month assumed command of the U. S. Army Aviation Center and became Commandant of the U. S. Army Aviation School, Fort Rucker, Ala. He succeeds Major General Bogardus S. Cairns who was killed in helicopter accident at the school on December 9, 1958.

Born at Fort Worden, Wash., General Easterbrook graduated from the U. S. Military Academy in 1931 and was commissioned a second lieutenant in the Infantry. Prior to World War II, he served at installations in the United States and Panama. While at Fort Benning, he completed the Company Officers' Course of The Infantry School (1934).

Assignments during World War II included various positions connected with the training of Chinese troops in the China-Burma-India Theater, and as Commander of the 475th Infantry Regiment. In the latter part of the Korean War, he commanded the 7th Infantry Regiment of the Third Division.

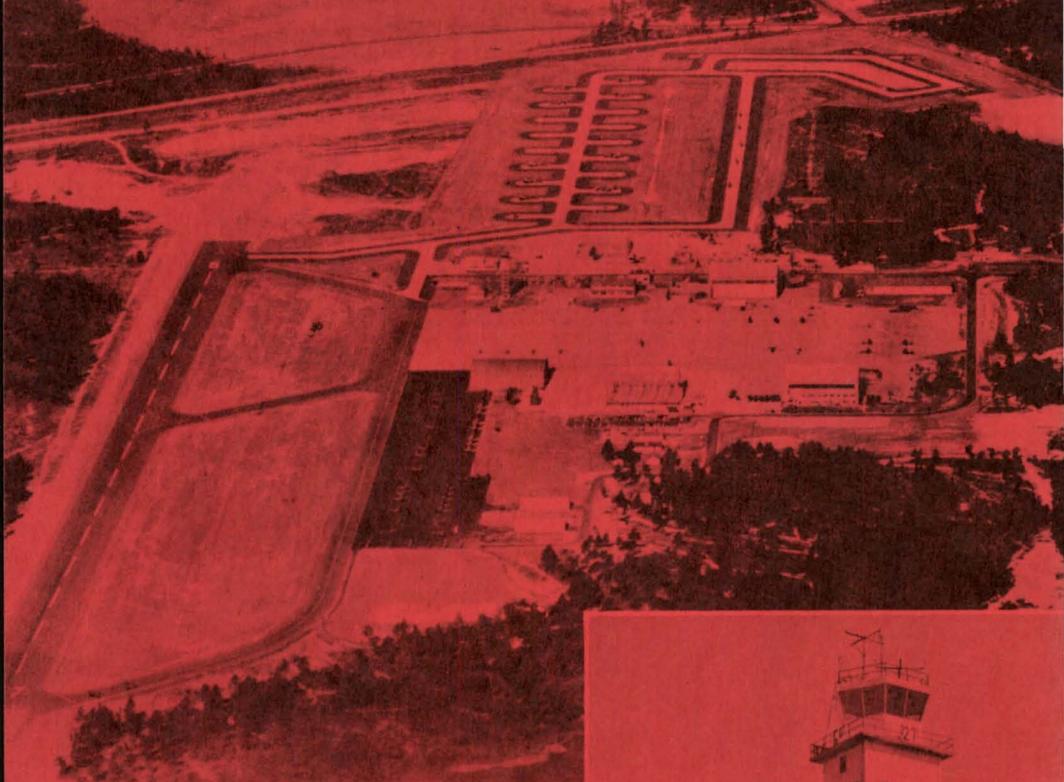
General Easterbrook's staff and faculty assignments following World War II include The Infantry School (1947-49), the Canadian Army Staff College (1949-51), Command and General Staff College (1954-55), and a NATO assignment as Assistant Chief of Staff, G-3, Allied Land Forces Central Europe (1955-57). He was also a member, Joint team, Joint Strategic Plans Group, Office, Joint Chiefs of Staff (1952-53); Senior Advisor, Replacement Training Center Number 1, Korean Military Advisory Group, Far East (1953-54); Student, Sanz School of Languages, (1955).

Prior to his assignment as Commanding General of the U. S. Army Aviation Center, General Easterbrook was Director of Army Aviation, Office of Deputy Chief of Staff for Military Operations, Department of the Army, Washington, D. C.

He is a graduate of The Command and General Staff College (1946), the National War College (1952), a qualified parachutist, and an Army Aviator rated in fixed wing aircraft.

His decorations include the Silver Star, Legion of Merit with Oak Leaf Cluster, and Bronze Star Medal with Oak Leaf Cluster.

# SIMMONS U. S. ARMY AIRFIELD



Simmons U. S. Army Airfield was named in honor of Warrant Officer Herbert W. Simmons, Jr., who was killed in a helicopter accident at Fort Bragg on 3 November 1953. The multi-million dollar field, commanded by Lieutenant Colonel Raymond H. Murphy, was established in 1956, and today is home for over 130 Army aircraft. The main runway at Simmons is 3,600 feet with 2 additional helicopter runways of 450 feet each. An average of over 200 landings and takeoffs are executed daily.

Five types of aviation fuel are available, including jet fuel for the Army's turbine and jet aircraft. About 2,000,000 gallons of aviation fuel are handled yearly.

Six hangars are in use for maintenance and general repair work, and two more are presently being erected. Modernization plans call for installation of GCA, Omni, homer beacon, and marker beacons.